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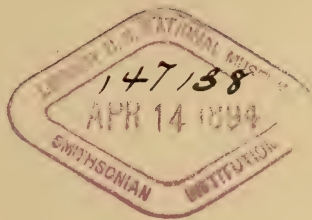
## NEW YORK ACADEMY OF SCIENCES,

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VOLUME VI.

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NOTE.—There are no plates accompanying the present volume.



Vol. VI.

December, 1891.

No. 1.

# ANNALS

OF THE

## NEW YORK ACADEMY OF SCIENCES,

LATE

### LYCEUM OF NATURAL HISTORY.



New York:

PUBLISHED BY THE ACADEMY.

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A N N A L S  
OF THE  
NEW YORK ACADEMY OF SCIENCES,  
VOLUME VI.

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I.—*A Catalogue of Rutherford's Photographic Plates of the  
Sun, the Moon, and the Stars.*

BY JOHN K. REES.

Read March 9, 1891.

On November 13th, 1890, Lewis M. Rutherford, LL.D., of New York City, presented to the Columbia College Observatory all his photographic negatives taken between the years 1858 and 1878. Many of the plates had been measured, and these measures were included in the gift. The measures fill some thirty quarto volumes. Several years ago (1884) Mr. Rutherford gave to the Observatory his 13-inch equatorial with its photographic corrector, with which the photographs, taken since 1868, were made; and at the same time he donated to the Observatory his measuring engine supplied with a *glass scale*. This improved measuring apparatus was used in January, 1872, and subsequently.

The star cluster negatives received an exposure of either three or six minutes. Each negative bears the date, time of exposure, a record of the barometer and thermometer readings, and other data necessary for the reductions.

The Observatory of Columbia College hopes to issue soon the reductions of many of the measures.

Mr. Harold Jacoby aided in the preparation of the catalogue.

COLUMBIA COLLEGE OBSERVATORY, New York, March 9, 1891.

## CATALOGUE OF RUTHERFURD'S NEGATIVES DEPOSITED AT COLUMBIA COLLEGE OBSERVATORY, NEW YORK CITY.

### SUN, NEGATIVES.

1860. April 27; May 4, 23 (two<sup>1</sup>), 25, 29 (two); June 6, 8 (two), 23, 26; July 17; Sept. 7; Oct. 24; Nov. 20.
1861. Feb. 19, 27; March 4; April 20 (two), 21, 22 (two), 24 (two), 25, 27, 29; May 2, 14, 30; June 1; July 29; Sept. 26.
1862. June 21.
1866. Feb. 3 (two).
1870. Feb. 16 (two), 17 (two), 23; March 3 (two), 11, 14, 15, 16, 17, 19, 20, 21, 24, 25, 26 (two), 29, 31; April 6 (two), 7, 8, 12, 13, 15, 16, 20, 26, 30; May 3, 13, 15, 16, 19, 21, 26; June 4, 18; July 29; August 6, 17, 20, 27 (two), 29; Sept. 1, 19, 20 (three), 23 (two), 24, 26, 28; Oct. 5, 8, 14.
1871. April 17, 18, 21; June 16; July 10, 16, 21, 22, 26; August 11, 12, 18 (two), 19.
1872. Jan. 2; Feb. 5; May 7, 10, 17; June 15, 27; July 6, 17; August 10, 12; Sept. 21; Nov. 27.
1874. April 5; May 7, 10, 15, 19, 27; June 1, 30; July 11; Sept. 28; Nov. 27; Dec. 9 (two).

*Remarks.*—139 negatives in the above list. Each negative has the time of exposure marked on the plate.

### SUN, POSITIVES, AND ENLARGEMENTS OF SUN SPOTS.

9 in number. August and Sept. 1871.

### SUN IN ECLIPSE.

1860. July 18. 10 negatives.
1865. Oct. 19. 9 negatives.
1869. Aug. 7. 8 negatives.

### SOLAR SPECTRUM.

160 negatives, of which 10 are sealed for special protection.  
14 positives.

### THE MOON, NEGATIVES.

1858. June; Nov. 2; Dec. 16, 20, 22, 24 (two).
1859. Jan. 17 (two); Feb. 10, 13, 14, 16 (two), 18; March 9 (two), 10 (three), 12 (two), 13 (two), 15, 16 (three), 18 (two); April 16 (four), 18 (two); Dec. 8.

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<sup>1</sup> This indicates the number of plates taken on May 23.



- 1860. Feb. 26; Nov. 20, 22.
- 1861. Dec. 18, 20.
- 1862. Jan. 7 (two), 9 (four), 16 (two); Feb. 9 (two), 10, 13 (two), 14, 18 (with Cassegranian telescope); March 4, 8 (two), 9 (three), 12, 17; April 6 (three), 10 (two), 12 (two), 13 (three), 14; Dec. 4, 12, 20, 28.
- 1863. Jan. 7; Feb. 19; April 26; May 1; Dec. 18 (two), 24.
- 1864. Feb. 13 (two); July 19; Sept. 9 (two), 20; Nov. 10, 13, 14 (five); Nov. 16 (three), 19, 23, 29; Dec. 4 (four), 12 (six).
- 1865. Jan. 8 (three), 11 (three), 12 (six), 18 (two), 19; Feb. 2 (two), 4 (five), 6 (two), 9 (four), 11 (four); March 5, 6 (seven), 11 (two); May 18; Aug. 4; Nov. 1 (two), 7.
- 1866. Feb. 26; Oct. 28.
- 1868. Oct. 29, 30 (three); Nov. 4 (four), 20, 23 (three), 24 (four).
- 1869. August (four).
- 1870. Feb. 12 (three), 16; March 16 (two), 18 (four); April 8 (two), 9 (three), 12 (two), 21 (three); May 12 (three), 14 (two); June 11 (two); July 4, 8 (two), 10 (two), 13 (two); August 6 (two), 7 (two), 13 (two), 14 (two), 15, 17 (two), 19 (two), 20; Sept. 11 (two), 13 (two), 14 (two), 15 (two), 19 (two); Oct. 14 (two), 16.
- 1871. Jan. 17; Feb. 28; March 28 (three); May 21, 29; June 26, 27; July 7 (three); August 27, 29; Nov. 2, 25, 27 (three); Dec. 2, 21 (two), 24 (two).
- 1872. Jan. 17, 24 (two); April 6, 16, 19; August 18; Sept. 21, 22 (two); Oct. 20 (three); Nov. 19 (three), 21 (two); Dec. 9, 10.
- 1873. Jan. 9 (two); May 6 (two); June 5; July 4 (three); Nov. 28 (two); Dec. 31 (two).
- 1874. Jan. 24, 25 (two), 27 (two), 31; Feb. 1, 27 (two), 28; March 26 (two), 28 (three), 29 (two); May 21 (two), 22 (two); Sept. 25; Oct. 26 (two); Nov. 27 (two).
- 1875. April 14 (two), 17; May 14 (two); June 14 (two); Oct. 18; Nov. 6 (three); Nov. 11 (two).
- 1876. Jan. 4 (two), 7 (two), 11 (three), 12 (two); Feb. 5 (two); April 6 (three); June 1 (two), 26; August 4 (two); Nov. 5 (two).
- 1877. Jan. 31; Feb. 21 (four), 27.

*Remarks.*—These moon negatives have the time of exposure on the plates.  
There are 368 negatives in above list.

THE MOON, SEALED NEGATIVES.

- 1864. Nov. 13.
- 1865. March 6.
- 1870. March 16; April 21; June 27; Sept. 16 (two); Oct. 13, 15, 16 (two).
- 1871. Feb. 28 (two); June 2 (three), 25 (three), 26; August 29 (two); Sept. 6; Nov. 18, 25 (two); Dec. 3.

1872. Jan. 25; April 19; Sept. 19, 23 (two); Oct. 21.

1873. Nov. 29 (two).

1874. Jan. 24; March 19, 21; May 21 (two).

*Remarks.*—40 sealed negatives in above list.

THE MOON, NEGATIVES ENLARGED.

1 plate.

POSITIVE ENLARGED.

3 plates.

POSITIVES.

1865. Sept. 3; July —; April 3 (two); Oct. 5, 6 (two), 8, 10 (six).

*Remarks.*—14 positives in above list.

SEALED POSITIVES.

1870. Sept. 16.

1871. Feb. 28; June 2.

1872. April 19; Oct. 21.

1873. Nov. 29.

1874. Jan. 24; May 19, 21, 22.

*Remarks.*—10 plates.

MARS AND STARS, NEGATIVES.

1877. August 10 (three), 11 (four); Sept. 2 (five), 3 (nine), 4 (four).

TRANSIT OF MERCURY, NEGATIVES.

1878. May 6 (twelve).

STAR PLATES.

$\gamma$  Andromedæ. 1859. Nov. 29 (two).

$\xi$  Aquarii. 1864. Nov. 16.

31 Aquilæ. 1870. August 15 (two), 17.  
1872. Oct. 29 (two).

16 Aurigæ. 1877. Feb. 10, 14, 19 (two).

$\alpha$  Bootis. 1870. June 24, 31 (two); July 13 (two).  
1871. June 17; July 13, 17 (two).  
1872. June 17, 30; July 10 (two), 30.  
1873. June 26 (two); July 11.  
1874. May 19 (three), 28; June 1, 2 (two).

21 Bootis. 1876. May 31; August 12 (three).

44 Bootis. 1868. June 20 (three), 23, 24 (three), 27, 29 (three).  
1870. August 14 (two).  
1871. July 14, 15 (two).  
1872. May 31 (two); June 28. } Measured Nov. 1873.  
1873. June 18 (two), 19 (two), measured Dec. 1873.

1874. May 17 (six), measured June, 1874.  
 1875. May 27, 28 (two); June 1 (two), measured Oct. 1875.
- Camelopardi. } 1876. April 17 (two), 21 (two), 22, 26.  
 B. A. C. 1565. }
- α Canis Minoris. 1866. Feb. 21 (two).
- 12 Comæ Berenicis. 1870. April 25 (two), 26.  
 1875. June 2 (three), 4 (two).  
 1876. May 26 (four), 27 (two).
- Cassiopeiaë, } 1873. Nov. 11, 14 (two), measured Dec. 1873; Nov. 22  
 B. A. C. 8083. } (three), measured Jan. 1874.  
 1874. June 1 (two), 12 (two), 13 (two), measured June and July, 1874.
- η Cassiopeiaë. 1870. July 30 (two); August 4 (two).  
 1871. July 17 (two); Dec. 18.  
 1872. Jan. 2 (two), 5; June 30 (two);  
 July 19 (two).  
 1873. Jan. 9, 20 (two); July 15 (two),  
 20 (two), 21; Dec. 15 (two),  
 18 (two), 21. } Measured  
 in 1873  
 and 1874.
- μ Cassiopeiaë. 1868. Nov. 6 (two), 13; Nov. 13, 23 (two), 24 (two).  
 Measured, 1869.  
 1869. July 21 (five); August 7 (four), measured 1870;  
 Aug. 29 (three), measured 1871; Oct. 31 (two);  
 Nov. 25; Nov. 25, measured 1871.  
 1870. Jan. 25, 26 (three), measured 1872; Feb. 16 (two);  
 July 23 (two), measured 1872; July 30; July  
 30, measured 1872; August 4.  
 1871. July 10 (two), 23 (two).  
 1872. Jan. 2 (two), 5; July 19 (two),  
 20 (two).  
 1873. Jan. 6, 9 (two), 10; July 15,  
 21 (two), 23 (three); Dec. 18 (two),  
 21 (two). } Measured  
 1872,  
 1873,  
 and 1874.
- Cephei. 1869. June 28; Oct. 31; Nov. 25 (three).
- Ceti, } 1872. Jan. 6 (two), 9 (two).  
 B. A. C. 793. } 1874. Jan. 10 (two), 11 (three), 12 (two).
- β Cygni 1875. July 26 (three); Sept. 20 (three). Measured 1875.  
 1876. May 31 (two); June 1 (two); Oct. 24 (three);  
 Nov. 4 (two).

- Cygni,  
 $\alpha = 20^h$   
 $\delta = +31^\circ 53'$  } 1875. Sept. 27 (three), 29; Nov. 8 (two).
- Cygni,  
 $\alpha = 19^h 38^m$   
 $\delta = +27^\circ 7'$  } 1876. June 6 (four).
- Cygni,  
 $\alpha = 19^h 38^m$   
 $\delta = +40^\circ$  } 1876. June 7 (two), 14 (two).
- $\chi$  Cygni. 1875. Sept. 20, 21 (three), 23 (two); measured 1876.
- $\eta$  Cygni,  
 21 Cygni. } 1875. July 21, 24 (two); Aug. 6 (two); Sept. 23 (three),  
 24 (two), 27 (two).  
 1876. June 1 (four), 19, 21 (three); Dec. 3 (two), 5 (two).
- Cygni,  
 B. A. C. 6986. } 1875. Sept. 24 (three); Oct. 12, 13 (two).
- 27 Cygni. 1874. Nov. 12, 14.  
 B. A. C. 6915. 1875. Oct. 20 (two).  
 1876. June 21 (four).
- 34 Cygni. 1875. July 19 (three); Oct. 2 (three).  
 1876. June 15 (four).
- 37 Cygni. 1875. July 19 (three); Oct. 20 (three).  
 1876. Nov. 29 (two); Dec. 3 (two), 31.
- 58 Cygni. 1875. July 30 (three); Nov. 11 (two).  
 1876. June 22 (two); July 14 (two); Nov. 12 (three),  
 16 (two).
- 59 Cygni. 1875. August 5 (three); Nov. 11.  
 1875. Nov. 17, 22, 24 (near 59 Cygni).  
 1876. July 22, 24; August 4 (two); Nov. 12 (two),  
 16 (three).
- 61 Cygni. 1871. Nov. 9, 12 (two). \*  
 1872. Nov. 29; Dec. 15 (two), 17.  
 1873. Nov. 15 (two), 20, 22 (three).  
 1874. June 1 (two), 12, 13 (two); illegible  
 date (two).  
 1876. July 17 (four).  
 } Measured  
 1874 and  
 1875.
- 71 Cygni. 1875. August 5 (three); Nov. 24, 25, 27.  
 1876. July 27 (two); August 5 (two); Nov. 24 (three),  
 28, 29 (three); Dec. 5 (two).



— Cygni,	} 1876.	Aug. 4 (two); 5 (two).
$\alpha = 21^h 28^m.$		
$\delta = +47^\circ 55'.$		
— Cygni,	} 1876.	August 9 (four).
$\alpha = 20^h 12^m.$		
$\delta = +36^\circ 41'.$		
— Cygni,	} 1876.	August 10 (four).
$\alpha = 21^h 18^m.$		
$\delta = +48^\circ 51'.$		
61 Draconis.	1871.	Nov. 17 (two).
40 Eridani.	1872.	Jan. 5 (two), 6.
	1874.	Jan. 10, 11 (two), 14 (three).
$\zeta$ Herculis.	1870.	August 18; Sept. 6 (two).
	1871.	July 17.
	1872.	Aug. 27 (two).
$\mu$ Herculis.	1870.	August 19 (two); Sept. 6, measured 1872.
	1872.	August 17, 30.
	1873.	August 5 (two).
1 Herculis.	1870.	August 14, 15 (two).
	1871.	July 13 (two), 23.
	1874.	May 17, 19 (two).
72 Herculis.	1870.	August 30; Sept. 4, 5 (two).
	1872.	August 17, 27, 28.
	1873.	July 30; August 2 (two), 5.
$\epsilon$ Lyræ.	1860.	August 7.
	1864.	Nov. 6.
	1865.	Aug. 7.
	1868.	May — (two); June 13 (two), 14 (three).
70 Ophiuchi.	1870.	August 11, 17.
	1871.	July 8 (two), 10 (two).
	1872.	Sept. 21 (two).
	1873.	July 11 (two), 15 (two).
$\epsilon$ Orionis.	1866.	March 6, measured.
	1877.	March 1 (three), 3 (two).
$\theta$ Orionis.	1865.	Feb. 24.
	1866.	Jan. 21, 23 (two), 27 (two).
— Orionis.	1865.	Feb. 24.
	1866.	March 6.
	1877.	Jan. 23, 31.
34 Persei.	1877.	Feb. 7, 8 (three).

35 Persei.	1877.	Feb. 6 (four).	
Perseus,	}	1865.	Feb. 18.
(clusters).		1868.	Nov. 4, 12 (two), 13 (two), 23.
		1870.	March 24 (three), 25 (two).
		1873.	Dec. 2, 18.
		1874.	Jan. 18 (three); Oct. 14 (three), 15; Nov. 6 (two).
Pleiades.		1865.	Nov. 15 (five), 16 (three).
		1866.	Jan. 1, measured Jan. 1867; Jan. 31 (two); Feb. 21 (two), measured 1866; Feb. 21 (three), 26 (three); March 6 (three), measured Jan. 1867; March 10 (three), measured July, 1866.
		1867.	Jan. 23 (two); 23, 27, measured 1867; Jan. 27; Feb. 7 (three), measured 1867.
		1868.	Oct. 30 (three); Nov. 3, 5, 12, measured 1869; Nov. 12, 13 (two), 14 (two), 15 (two), 23.
		1872.	Jan. 9 (two), 26. } Measured
		1874.	Nov. 7 (two), 12, 26 (two). } 1875.
Præsepe.		1865.	Feb. 21 (two), 27.
		1866.	March 10 (two).
		1867.	Jan. 27; Feb. 3, measured 1867; Feb. 7 (two); April 3 (two), 18.
		1870.	April 24 (two), 25 (two).
		1877.	April 14, 25 (three); May 2 (three).
41 Serpentis.		1870.	July 30 (two), 31.
		1872.	Aug. 27, 30 (two).
θ Ursæ Majoris.		1872.	May 27, 31; June 13.
		1873.	May 18 (two), 26 (two).
— Ursæ Majoris.	}	1872.	Jan. 5 (two); May 27; June 11,
B. A. C. 4010.			16 (two).
1830, Groom- bridge.		1873.	June 8 (two), 9 (two), 12 (two).
		1874.	Jan. 14 (two); Feb. 16 (three); June 12, 13 (three), 14 (two).
			} Measured 1874.
82 Ursæ Majoris.	}	1876.	May 26, 27; August 11 (two), 12 (two).
B. A. C. 4564.		1877.	March 5 (two), 7 (three).
— Vulpeculæ.	}	1872.	Nov. 13 (two), 17.
B. A. C. 6654.			
— Vulpeculæ.	}	1870.	August 18 (two), 19 (two).
B. A. C. 6657.		1872.	Oct. 31.
— Vulpeculæ.	}	1874.	Nov. 12 (two), 16 (three).
B. A. C. 6762.			
20 Vulpeculæ.	}	1874.	Nov. 12 (three).
B. A. C. 6944.			

## II.—*Coleopterological Notices.*

### III.

BY THOS. L. CASEY.

Read October 5, 1891.

The most important contribution presented in the following paper, at least from a systematic standpoint, is a review of the Cistelidæ of the United States, but I feel only too fully that the discussion of the species of a local fauna, however complete and well intended it may be, can count but scarcely more than as a letter in the alphabet of a general monograph. In the absence of representatives from other parts of the earth, we labor to a great extent blindly in the delimitation of the higher groups, and in selecting proper structural characters for the differentiation of the genera.

For various reasons, however, the accumulation of the necessary material for a general revision of any family of Coleoptera, is now an exceedingly difficult matter, and this difficulty is, with the present system of museum management throughout the world, a constantly increasing one. Whether or not we are to have any more epoch-making monographs, is becoming largely a question for the museums to decide, for it is here that material is principally accumulating.

These reflections call to mind another feature of the case, in which this restrictive policy of the museums is to a great degree embarrassing, and which concerns us on this side of the Atlantic more particularly—I refer to the American types of Mannerheim, Mäklin, Eschscholtz, and Motschulsky. These are now reposing in extreme security within some almost inaccessible European museums, where they are practically never disturbed, but if transferred to an American museum where they could at least be occasionally examined by our working entomologists, it would be a vast aid to us and would be a loss scarcely at all appreciable to them. I go so far as to say that all satisfactory study on our part in certain directions is completely checked, because of the absence of these types; from an

equitable and reasonably liberal point of view they should be placed in our keeping, for the descriptions to which they answer are in general quite insufficient, and are often worse than useless from inaccuracy of statement.

After this short and I trust pardonable digression, it only remains to be said, that the present opportunity has been taken to publish the descriptions of some other more or less interesting species, mainly in the Longicornia and Heteromera.

NEW YORK, August 18, 1891.

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#### NOTE.

In a report of the proceedings of the Second Ornithological Congress (Nature, No. 1129, p. 153), it is stated that among other resolutions favorably passed upon was the "adoption of names, even faulty in construction or misspelt, with all the consequences." The phrase "*with all the consequences*" affords a convenient pretext for the further discussion of certain matters concerning nomenclature, which I have previously touched upon to some extent.

The designation of every species consists of two distinct parts: the generic symbol and the specific name. The former need not necessarily have any meaning whatever, the latter always must have a meaning; we should therefore apply to these two parts rules which are somewhat different.

I apply the word "symbol" to the generic designation, because the latter is not a word in the ordinary sense of being a combination of letters possessing linguistic meaning, but is simply a coördination of letters, the sole conditions of which are that of being readily pronounceable, or consisting of consonants and vowels harmoniously arranged, and of having a Latin termination, in order to determine generic endings in the specific name. Even this last condition has not been strictly complied with, as a great many generic symbols have Greek or barbarian terminations, often necessitating the arbitrary determination of gender; nevertheless, words with endings which are neither Latin nor Greek, such as *Marail Less.* and *Lemming Cuv.*, should not be admitted. The earliest printed symbol satisfying these conditions should be the one adopted.

The specific designation is, however, a word taken from the Latin, or from any other language through the Latin by universal agreement, in order to avoid the undue favoring of any of the languages at present in use, and the inevitable discordances of opinion which would result therefrom. As one of the prime conditions of the specific name is that it shall have a meaning, and must therefore be linguistic in form and origin, there can be no objection to the alteration of the printed word to suit the proper rules of orthography or gender, when the intentions of the imposer of the name are evident. There are, in fact, on the ground of uniformity and simplicity, many reasons why this should be done, and why rules should be laid down and followed for writing specific names derived from various sources.



Now let us ask the question: Upon what foundation principle does the permanence and inflexibility of our nomenclature depend?—for no scientific notation or symbolization in any branch of human investigation can be of value, which is not put beyond the power of individual opinion to alter at pleasure. This question seems to be easily answerable if (1) we agree to adopt the earliest properly published combination of letters intended to represent any particular genus, and (2) if we formulate invariable rules for writing specific names, but is apparently unanswerable under any other conditions. If a writer be permitted to alter the original spelling of a generic symbol on the ground of incorrect orthography, we at once dispel any hope of permanence in nomenclature, and open the door to new argument and discussion which may result in a subsequent author giving a third designation, based upon his own conception of the hypothetical intentions of the original namer, and so on without end to the ultimate destruction of all semblance of stability: for there are differences of opinion as to the proper spelling of certain words in all languages.

If it be asked why the generic symbol need have no meaning in any language which has ever existed, while the specific designation is required to have a meaning in or through the Latin, it may be answered that it simply results from the condition of nomenclature as we find it to-day. One need but glance over a small portion of the great Munich Catalogue, to see that the proportion of generic words of unknown or dubious etymology, is so great as to give character to the whole, and to necessitate the rule that generic words must simply be considered harmonious combinations. In regard to the specific names, however, we can perceive at once that the proportion of words among them which are devoid of meaning or withdrawn from the influence of linguistic rules, is not large enough to have any weight at all.

In view of these facts, it is quite incomprehensible how the original generic symbols *Brentus*, *Sitona*, *Monochamus*, *Leiopus*, *Leichenium* and a host of others, could have been changed as they have been. Are not the words noted harmonious combinations, and, *as such*, are they not as much entitled to stand as *Brenthus*, *Sitones*, *Monohammus*, *Liopus*, and *Lichenium*? We must go back to the original mode of spelling generic names before nomenclature can be placed upon an absolutely stable foundation. The next catalogue similar in scope to the Munich Catalogue, will be the first suitable opportunity for effecting this change, and it is hoped that the liberties in spelling which have been proposed in the one alluded to, and which constitute its only serious blemish, will not be repeated.

Other questions involving more or less difference of opinion occasionally arise, as for instance whether generic names, differing only in termination by reason of gender or derivation, as for example *Oplocephala* and *Oplocephalus*, *Platycerus* and *Platyceras*, or *Tylas* and *Tylos*, should be maintained as distinct. As the words become shorter such differences of ending constitute a great part of the entire symbol. *Ulus*, for example, is quite a different word from *Ula*, *Ixus* from *Ixa*, *Janus* from *Jana*, and numerous such resemblances exist at present, but if we admit that *Ulus* and *Ula* are satisfactory as generic

symbols, and there can be but little doubt that they are, we must also admit *Oplocephala* and *Oplocephalus*; we should have absolute and consistent law throughout. I believe the difficulty can be overcome if we hold that generic symbols are not words in any sense, but constants, analogous to the constants of a mathematical formula; that they form part of no language,—although Latin by induction, and that they are completely indeclinable, except when used in the genitive as specific names or in the nominative plural as group names. Under these circumstances *Ulus* and *Ula* would be distinct and different combinations of letters, and could be maintained as genera with perfect propriety.

The Ornithological Congress has passed favorably upon the trinomial nomenclature. In regard to this it need only be said that the admission is a dangerous one, for it will result finally in names including four, five or even six words, and nomenclature will gradually become involved in a web of its own weaving. If the trinomial nomenclature is admitted, it should only be with the understanding that either the specific or subspecific name be bracketed. Our system should remain essentially binomial.

## CUCUJIDÆ.

### LYCTUS Fab.

The characters given by me (*Ann. N. Y. Acad. Sci.*, V, p. 324), to distinguish the two genera *Lyctus* and *Trogoxylon*, I find to be of no value, for, while applicable to the latter as represented by *parallelopipedus*, the distance separating the anterior coxæ gradually diminishes through *californicus* and *punctatus* to the slight prosternal width characterizing *cavicollis* and others. So also in regard to the external prominence of the anterior tibiæ at apex, not at all discernable in *curtulus* and a little more pronounced in *parallelopipedus*, it becomes normally prominent in *punctatus*, this character not having the value here which it has in *Eurymetopon*. The elytral punctures are completely devoid of serial arrangement in *parallelopipedus*, have a slight tendency thereto in *punctatus*, and are distinctly seriate in *californicus*. There are the same gradations in regard to the prominence of the apical angles of the prothorax.

I am forced therefore to regard *Trogoxylon* as a synonym of *Lyctus*, and, a few new forms having been recently received, the present opportunity is taken to give a complete statement of our species as far as known:—

Elytra with series of large rounded shallow punctures, the intervals each with a single series of small coarsely setigerous punctures.....**striatus**

Elytra without series of large shallow punctures, the punctuation however having a more or less distinct serial arrangement.

Apical angles of the prothorax rounded.

Prothorax longer than wide, not or extremely feebly and narrowly impressed; body ferruginous.....**opaculus**

Prothorax quadrate.

Ferruginous; pronotum broadly, rather strongly impressed.

**cavicollis**

Black; pronotum more shining, more sparsely punctate, less convex and less impressed along the middle .....**planicollis**

Prothorax much wider than long, nearly as wide as the elytra; body black .....**parvulus**

Apical angles of the prothorax not rounded.

Larger species; eyes large; elytral series well marked.....**carolinæ**

Small species; eyes small; elytral series more feebly defined.

**californicus**

Elytra with the punctures denser, confusedly arranged or without distinct serial arrangement; apical angles of the prothorax not rounded.

Prothorax as long as wide or extremely nearly so; anterior coxæ widely separated.

Anterior tibiæ gradually much broader from base to apex, not everted externally; basal angles of the prothorax narrowly rounded.

**curtulus**

Anterior tibiæ slender, gradually but slightly broader, and finely, externally everted at apex; basal angles of the prothorax not rounded.

**parallelopipedus**

Prothorax much wider than long.....**punctatus**

In the genus *Lycetus* the slight serricorn affinity indicated perhaps through some extinct or undiscovered genus allied to *Psoa*, is parallel to the melyride affinity of *Berginus*, as shown by its general habitus, and means nothing more, the two affinities being about equally pronounced.

**L. carolinæ** n. sp.—Parallel, moderately slender, rather convex, ferruginous, the head and prothorax darker than the elytra; integuments shining, the vestiture rather inconspicuous, yellowish. *Head* rather coarsely, moderately densely punctate; antennæ slender, one-half longer than the head, the club moderate, joints three to five subequal, nearly twice as long as wide. *Prothorax* about as long as wide, the apex distinctly wider than the base, evenly, strongly arcuate throughout; base broadly but less strongly arcuate; sides feebly convergent from the apical to the basal angles and just visibly sinuate throughout; apical angles feebly, laterally prominent, right, very slightly blunt but not rounded; basal angles slightly obtuse but not at all

rounded; disk feebly convex, broadly, distinctly impressed along the middle, rather coarsely, deeply and densely punctate, the interspaces narrow but polished; pubescence short and rather sparse. *Elytra* about three times as long as the prothorax and but just visibly wider than the latter, about two and one-third times as long as wide, parallel, the sides straight, very abruptly and obtusely rounded behind, the humeri right, narrowly rounded and rather broadly exposed; disk cylindrically convex, the punctures rather fine but deep, slightly oval, unevenly aggregated in narrow distinct series, but confusedly arranged near the suture, more broadly so toward base, the intervals between the series minutely, confusedly and sparsely punctate, the setæ rather short, fine and recumbent, the series apparently feebly impressed. *Abdomen* shining, minutely, rather densely and unevenly punctate. Anterior coxæ separated by fully one-third their own width; anterior tibiæ strongly and externally produced at apex. Length 3.8 mm.; width 1.0 mm.

South Carolina. Mr. Morrison.

A single specimen. This species is easily distinguishable from *striatus*, which it perhaps most closely resembles, by its entirely different elytral punctuation and thoracic structure.

**L. californicus** n. sp. (Crotch MS.).—Rather slender, parallel, somewhat strongly depressed, castaneous to piceous-black, strongly shining; pubescence not conspicuous. *Head* transverse, somewhat coarsely and densely but shallowly punctured, the epistomal suture deep, transverse, the epistoma short, almost impunctate, polished; eyes rather small, convex; antennæ slender, compact, almost glabrous, one-half longer than the head, the club small and slender. *Prothorax* as long as wide, feebly narrowed from apex to base, the apex broadly, strongly arcuate, the base subtruncate; sides straight, minutely denticulate throughout; apical angles right, not rounded, basal slightly obtuse, minutely denticuliform and prominent; disk feebly convex, broadly, feebly impressed in the middle and finely canaliculate near the base, coarsely punctate, the punctures not very dense, shallow, becoming fine and sparse anteriorly especially toward the middle; pubescence coarse but sparse. *Elytra* a little less than three times as long as the prothorax and but very little wider, a little more than twice as long as wide, parallel, the sides straight, feebly convergent and arcuate toward apex, the latter rather narrowly subtruncate; humeri right, scarcely at all rounded, distinctly exposed; disk moderately convex, polished, rather finely, sparsely punctate, the punctures deep but narrow and elongate, arranged in subeven single rows except toward the suture and base, where they are confused, the intervals not perceptibly punctate, the coarse sparse recumbent setæ entirely filling the punctures and rather irregularly distributed. *Abdomen* polished, excessively minutely and sparsely punctate. Anterior coxæ widely separated, the prosternum polished and almost completely impunctate. Anterior tibiæ strongly broadening toward apex, the apical angle acute and distinctly prolonged outwardly. Length 2.2–2.5 mm.; width 0.65 mm.



California (Fort Yuma). Mr. H. F. Wickham.

One of the two specimens before me has the prothorax more strongly narrowed behind than the type above described, the difference being probably sexual in nature. It will be observed that the characters of this species are quite composite, the outer apical angle of the anterior tibiæ being prolonged and acute, the elytral punctures distinctly serial in arrangement, and the anterior coxæ widely separated. It is the smallest of the genus known to me from our territories.

**L. curtulus** n. sp.—Parallel, rather depressed, pale brownish-testaceous throughout, moderately shining, the vestiture coarse, yellowish, moderately long and dense and somewhat conspicuous. *Head* rather coarsely, very densely punctate, the epistoma less densely so, the suture very deep, broadly arcuate; eyes moderate in size and prominence; antennæ stout, nearly one-half longer than the head, the third and fourth joints subequal and each rather distinctly shorter than the fifth, club small but robust, oval and rather compact. *Prothorax* as long as wide, distinctly narrowed from apex to base, the apex broadly, strongly arcuate; base very feebly arcuate; sides straight; apical angles very slightly obtuse, not rounded although slightly blunt, basal more broadly obtuse and decidedly blunt; disk feebly convex, broadly feebly impressed in the middle except toward apex, with a fine deep canaliculation near the base, moderately coarsely, very densely punctate, a little more sparsely so near the apical margin. *Elytra* two and one-half times longer than the prothorax and scarcely at all wider than the latter, not distinctly more than twice as long as wide, the apex broadly, abruptly and obtusely rounded; humeri right, not rounded but a little blunt; sides straight; disk rather closely, confusedly punctate, with two or three feebly defined, narrow, impunctate lines on each. *Abdomen* polished, minutely and very sparsely punctate. Anterior coxæ rather widely separated, the prosternum polished and almost impunctate, the hypomera rather finely and very densely so throughout. Anterior tibiæ gradually much broader from base to apex but with the exterior angle not at all produced outwardly. Length 2.7 mm.; width 0.8 mm.

California.

The two or three narrow, slightly oblique, impunctate lines on each elytron, is a character which is also sometimes observable in *parallelopipedus* and *punctatus* but much less distinctly. The present species differs from *californicus* in its broader form, denser punctuation especially of the hypomera and elytra, in its more narrowly separated anterior coxæ, and in its uneverted exterior apical angles of the anterior tibiæ, as well as in its stouter antennæ with much larger club and in its slightly larger but less convex eyes.

*L. punctatus* Lec. from Cape San Lucas is a remarkably aberrant

species, broader and more convex in form than any of the others, and with the elytra narrowed from apical third, more narrowly subtruncate and broadly arcuate at apex. The head is transverse, with the eyes moderate in size and strongly convex, the antennæ stout, nearly normal in size and structure but with the club parallel, the epistomal suture very fine and scarcely perceptibly impressed. The prothorax is much wider than long, nearly as wide as the elytra, feebly narrowed from apex to base and with the sides feebly, evenly arcuate throughout, the disk being feebly impressed in the middle toward base. The elytra are not quite twice as long as wide, very coarsely deeply and confusedly punctate, the punctures toward base becoming dense and subcoalescent. The abdomen is polished, minutely and sparsely punctate, the prosternum polished, rather strongly but sparsely punctate, the process being rather broad between the coxæ. The anterior tibiæ have the exterior apical angle prolonged outwardly and acute. The head and pronotum are rather coarsely and densely and unusually deeply punctured, and each puncture of the entire upper surface bears a short robust erect seta, which is coarsely plumose or bushy in structure. The feebly marked epistomal suture, parallel antennal club and peculiar vestiture may perhaps warrant the generic isolation of this species, in which event the name *Trogoxylon* Lec. could be appropriately adopted for it.

## ELATERIDÆ.

### **CHALCOLEPIDIUS** Esch.

The following species belongs near *webbi* Lec., but is much larger:—

**C. apacheanus** n. sp.—Moderately slender and convex, smooth, polished, intense black throughout, clothed rather densely with small robust recumbent and squamiform hairs, which are strongly convex and finely pointed, dark bluish in color, giving a deep violet-blue bloom to the surface, the lateral edges of the pronotum rather broadly, and of the elytra very narrowly, clothed with dense white recumbent pubescence, the white border abruptly limited. *Head* strongly impressed, rather coarsely, deeply, sparsely punctate, the interspaces very finely, densely punctate; antennæ short, two-thirds as long as the prothorax, pruinose with violet-blue, the third joint but slightly shorter than the fourth. *Prothorax* one-fifth longer than wide, in form nearly as in *webbi*, very finely, moderately closely punctate throughout and with scattered coarser punctures anteriorly, especially toward the sides. Scutellum a little wider than long, polished. *Elytra* in form and relation to

the prothorax nearly as in *webbi*, polished, very minutely feebly and rather sparsely punctured, with somewhat uneven, completely unimpressed series of fine, rather distant punctures. Under surface polished, pruinose with violet-blue toward the sides, minutely, feebly punctulate. Length 36.0–38.0 mm.; width 12.0–12.5 mm.

Arizona (Fort Apache).

This species differs from *webbi*, in addition to its very much larger size, in the decidedly longer third antennal joint in the male, more minutely punctulate surface with the pronotum coarsely punctate anteriorly, in the strong impression of the head, in the abruptly limited and much narrower marginal white vittæ, and in the sparser and deep violet-blue vestiture, the latter being extremely dense, paler and olive-green in *webbi*. Together with *webbi*, it belongs to Section III of Candèze, and in the vicinity of *circumductus*, from which it differs in its entirely flat and not alternately convex elytral intervals.

## SCARABÆIDÆ.

### POLYPHYLLA Harris.

The western species which are homologues of *decimlineata* in ornamentation, may be easily identified as follows:—

Antennal club of the male very large, fully three times as long as the stem; vestiture more or less strongly squamiform.

Antennal club of the female nearly as long as the entire stem; pygidium in both sexes pilose and very sparsely squamose.....**speciosa**

Antennal club of the female about one-half as long as the stem; pygidium in both sexes densely squamose, not at all pilose, with a narrow denuded median line.....**decimlineata**

Antennal club of the male much smaller, not more than twice as long as the stem; vestiture less strongly squamiform.

Pygidium of the male with the edge strongly reflexed at and toward the apical angle; elytral vittæ always dense and distinctly limited; color generally castaneous; spurs of the hind tibiæ extremely unequal, the longer nearly twice as long as the shorter and generally bent...**crinita**

Pygidium of the male with the edge not reflexed at apex; elytral vittæ more or less unevenly disintegrated; color piceous-black; spurs of the hind tibiæ much smaller, straight and subequal .....**diffracta**

My series of *decimlineata* is very full, embracing specimens from Puget Sound, California, New Mexico, Texas and San Luis Potosi, and throughout this region there is but slight variability exhibited in either sex. *Speciosa* is a remarkable species, distinct from *decim-*

*lineata* in its larger size, broader and more depressed form and sparser vestiture, in addition to the characters given in the table.

*Crinita* seems to be comparatively limited in range, all the specimens which I have seen being from Southern California. The following is allied to *crinita*:—

**P. diffracta** n. sp.—Oval, strongly convex, piceous-black, polished, the vestiture consisting of very narrow, extremely sparsely scattered scales intermingled with longer erect hairs on the pronotum, the latter trivittate, each elytron with a very narrow sutural and three discal vittæ of denser white scales, also a short humeral vitta which is more or less evanescent, but sometimes prolonged, the elytral vittæ more or less disintegrated and uneven. *Head* coarsely, densely punctate, the clypeus broadly reflexed, extremely broadly, feebly bisinuate at apex and very densely clothed with yellow squamose pubescence. *Prothorax* twice as wide as long, the apex broadly emarginate and much narrower than the base; sides broadly subangulate; lateral vitta interrupted anteriorly. *Elytra* about three times as long as the prothorax, and, in the middle, one-third wider than the latter, rather finely, sparsely punctate and subrugulose. *Pygidium* slightly wider than long, very densely squamulo-pubescent except toward the sides, where it is very sparsely so, also with a subdenuded median line. Length 21.0–24.0 mm.; width 10.3–11.3 mm.

New Mexico (probably near Las Vegas).

The two specimens before me are males; there is another in the cabinet of Mr. Jülich in which the elytral vittæ are still more disintegrated. The antennal club of the male is still somewhat smaller than in *crinita*.

*Subvittata* and *hammondi* of LeConte are easily distinguishable from each other by the antennal character separating *decimlineata* and *crinita*. The male club in *subvittata* is fully three times as long as the stem, and in *hammondi* but slightly more than twice as long as the latter; there are differences also in the general character of the elytral ornamentation, form of the clypeus, size and other characters, showing that the two species are without doubt distinct. Mr. Dunn, who has taken both of them abundantly, states that they are never found together.

#### THYCE Lec.

With increased care in collecting, the species of this interesting genus are becoming somewhat numerous on the Pacific coast, where they replace *Lachnosterna* to some extent. The species appear to be more nocturnal than crepuscular in habit, and, although proba-



bly constituting a moderately large genus, are unquestionably much less numerous than those of *Lachnosterna*.

The two following species have been received since my last reference to the genus:—

**T. blaisdelli** n. sp.—Robust, moderately convex, form nearly as in *fossiger*, rather shining, pale rufo-castaneous in color, the humeri and under surface blackish; vestiture pale ochreous in color.

*Male*.—*Head*, excluding the eyes, subquadrate, but slightly wider than long, very densely clothed with short robust pubescence and long erect hairs; clypeus moderately reflexed, very feebly sinuate, the angles broadly rounded; antennæ moderate, the club slender, straight, a little shorter than the stem; fourth joint of the maxillary palpi unusually robust, oval, twice as long as wide, about three-fourths as long as the antennal club, the groove wide, deep, extending from base to apex, two and one-half times as long as wide, the bottom broadly, evenly concave and alutaceous in lustre. *Prothorax* two-thirds wider than long, broadly lobed at base and subangulate at the sides, somewhat coarsely and densely punctate, clothed rather densely with robust squamiform pubescence and fine, moderately long erect hairs. Scutellum densely punctate and squamose. *Elytra* about one-third longer than wide and nearly one-half wider than the prothorax, the apex broadly subtruncate; sides feebly arcuate; humeral callus rather prominent; disk shining, moderately densely and unevenly punctate and subrugulose, the punctures somewhat strong, the vestiture consisting of short recumbent moderately densely placed hairs, which are robust but not at all squamiform. Pygidium finely, densely punctate and clothed like the elytra. *Abdomen* finely, densely punctate and very densely squamulo-pubescent, the vestiture whiter than that of the upper surface; sterna with the usual long silken pile. *Legs* rather short, the posterior tarsi distinctly shorter than the tibiæ; ungual teeth of the corresponding tarsi very unequal, the anterior twice as long as the posterior. Length 20.0–23.0 mm.; width 9.4–11.0 mm.

California (Coronado, San Diego Co.). Dr. F. E. Blaisdell.

This species, which is represented by the male only, is somewhat allied to *fossiger*, but differs in its more robust and less densely placed elytral vestiture, shorter, much broader terminal joint of the maxillary palpi and in its shorter posterior tarsi.

I have before me a female, pale brownish-rufous in color, strongly shining throughout, with the elytral pubescence excessively fine and sparse, much shorter and finer than in *squamicollis*, but about twice as dense as in that species. It was taken at Los Angeles and probably represents still another species which it would not be advisable to describe in the absence of the male. It may possibly be the female of the present species.



**T. squamosa** n. sp.—Oblong-oval, strongly convex, piceous-black; integuments shining.

*Male*.—*Head* densely punctate, clothed with long erect hair and shorter recumbent squamiform hairs, the vestiture of the clypeus a little sparser; vertex not tuberculate; clypeus broadly, feebly sinuate, strongly reflexed, the angles obtuse and but slightly marked; antennæ moderate, the club nearly three-fourths as long as the stem; fourth joint of the maxillary palpi very long, fully one-third longer than the antennal club, with a narrow, very deep, parallel-sided groove throughout the length. *Prothorax* one-half wider than long, the apex broadly, evenly emarginate, fully one-half as wide as the base, the latter broadly subangulate; sides broadly subangulate, the margins strongly reflexed toward base, feebly serrate; apical angles narrowly rounded, basal rather obtuse and broadly rounded; disk very strongly convex, narrowly impressed along the middle, coarsely, densely punctate, clothed with long erect hair and long robust recumbent and squamiform pubescence, which is dense along the median line except near the base. *Scutellum* densely punctate and squamose. *Elytra* one-third longer than wide, one-third wider than the prothorax, subparallel; sides feebly arcuate; humeri rounded; apex broadly subtruncate; disk finely, somewhat densely punctate and clothed with distinct pointed scales. *Pygidium* slightly wider than long, convex, densely clothed with long narrow scales and short hairs. *Abdomen* somewhat densely clothed with elongate scales and short hairs, the sterna densely pilose. *Legs* moderately slender; hind tarsi fully as long as the tibiæ, with the tooth of the anterior claw nearly twice as long as that of the posterior.

*Female*.—Larger and stouter than the male, the vertex tuberculate, the antennal club small and oval, the fourth joint of the maxillary palpi three-fourths as long as the latter, elongate-triangular, with a narrow deep elongate groove not quite attaining the base or apex; pygidium much wider than long; anterior tibiæ robust; hind tarsi two-thirds as long as the tibiæ, the teeth of the claws small and more nearly equal. Vestiture throughout consisting of minute recumbent hairs, sparsely placed, with erect hair as in the male.

Length 20.0–23.0 mm.; width 9.3–11.3 mm.

California (San Luis Obispo Co.).

A distinct species, somewhat related to *harfordi*, but easily distinguishable by many characters of both sexes. The tubercle of the vertex is, throughout the genus, particularly characteristic of the female.

## CERAMBYCIDÆ.

### ERGATES Serv.

#### Subgen. TRICHOCNEMIS Lec.

The principal character upon which reliance was placed in separating *neomexicanus* from *spiculatus*, is rendered somewhat doubt-

ful from the fact that similar differences, in the male sexual characters at the apex of the abdomen, are observable in specimens apparently taken in the same locality. I have observed them in examples said to have been collected in Oregon, and forming part of the cabinet of Mr. Ulke, and Dr. Horn states (Tr. Am. Ent. Soc., XVIII, p. 41) that they are equally visible in specimens in his own cabinet taken in Vancouver Island.

Nevertheless there are some circumstances which lead me to believe that this is not a case of ordinary fortuitous variation, the chief of which is the apparent want of any known male specimen in which the modification of the fifth segment is truly intermediate between the forms figured on Plate IV, Vol. V, of these Annals. Another singular fact is the remarkable disparity in general form and several important structural characters, as exhibited in the assumed male type of *spiculatus*—represented by a specimen in my cabinet taken near the shores of Cœur d'Alène Lake, Idaho—and the specimens taken by Mr. Meeske at Las Vegas, New Mexico.

Not being able, therefore, to be fully satisfied that the species described by me as *neomexicanus* is actually the same as *spiculatus*, it seems only right that the question should be held in abeyance until more material can be collected in both of these, as well as in other, localities. When this is done, and if it be then proved that the two names are truly synonymous, I believe that it will be demonstrated at the same time that the male of *spiculatus* is dimorphous.<sup>1</sup>

#### **PRIONUS** Geoff.

The following species is allied to *imbricornis*:—

**P. debilis** n. sp.—Narrow, subparallel, rufo-testaceous, the elytra pale brownish flavate, thin and almost coriaceous; lustre moderately shining.

<sup>1</sup> Since this was written I have compared the females of the two forms in question, and find that the mandibles of *spiculatus* are bidentate internally, the teeth being situated before and behind the middle respectively, while in *neomexicanus* there is but one tooth, situated at the middle; in the latter the basal joint of the antennæ is much shorter than in the former in both sexes, but especially in the female. Having in mind the comparative constancy of female structural characters, these observations tend to materially strengthen my original position, in regarding the two specimens of *spiculatus* and four of *neomexicanus* which I have before me, as representative of two distinct but rather closely allied species. *Spiculatus* inhabits the Pacific districts, extending inland toward the north and descending along the Rocky Mountains as far as Colorado; to the southward of this limit it is replaced by *neomexicanus*.

*Head* coarsely, deeply punctate, sparsely so behind; eyes separated above by three-fourths of their own width; antennæ (male) two-thirds as long as the body, nearly as in *imbricornis*, 18–19 jointed. *Prothorax* more than twice as wide as long, two-thirds wider than the head and three-fourths as wide as the elytra; base and apex equal, transverse, each feebly sinuate laterally; sides parallel, feebly dentate at base and apex and also just before the middle; disk rather finely and sparsely punctate. *Elytra* twice as long as wide, parallel, the sides feebly arcuate, obtusely rounded behind, narrowly dehiscent from basal third or fourth; inner apical angle obtuse, with scarcely an indication of the everted tooth of *imbricornis*; disk coarsely, deeply, subrugulose punctate. *Legs* slender, posterior tarsi very slender, the under surface densely pubescent only in two small spots at the apices of joints one to three. Length 20.0–24.0 mm.; width 8.0–9.5 mm.

Indiana; Missouri; Kansas.

Represented by a very homogeneous series of seven male specimens from the Levette cabinet; I have not seen the female.

This species is allied to *imbricornis*, having nearly the same antennal structure, but differs in its much smaller size, narrower, more parallel and less convex form, less chitinated and paler elytra, in the more widely separated eyes and in the vestiture of the hind tarsi. In the normal forms of *imbricornis*—for there seems to be at least one undescribed variety of this species before me—the eyes are separated above by much less than one-half of their own width, and the posterior tarsi are densely pubescent throughout joints one to three, in a widely divided line except toward the base of the first joint. The upper surface of the antennæ is much more coarsely and sparsely punctate throughout in *debilis* than in *imbricornis*, this being one of the most striking and constant of the differential characters.

#### **TETROPIUM** Kirby.

The species before me may be recognized as follows—the characters throughout being taken from the female, except when otherwise mentioned:—

Elytra wider than the prothorax; third antennal joint in the male much longer than the second.

Third antennal joint (female) pyriform, unusually short, scarcely twice as long as wide; pronotum very sparsely punctate except laterally; elytra generally pale ..... **cinnamopterum**

Third antennal joint (female) much more elongate, always distinctly more than twice as long as wide; pronotum very densely punctate.

Pronotum with a narrow and abruptly limited median impunctate area toward base, which is subcarinate; elytra generally pale.

**parallelum**

Pronotum without a median impunctate area except narrowly and vaguely toward base; elytra usually concolorous.

Sides of the prothorax broadly rounded; pygidium evenly parabolic.

**schwarzianum**

Sides of the prothorax vaguely subangulate in the middle, the punctation very fine, extremely dense; pygidium triangular with the apex narrowly subtruncate.....**velutinum**

Elytra not wider than the prothorax; second antennal joint of the male but slightly shorter than the third, the latter equal in length to the fourth.

**parvulum**

The forms of *Tetropium* here mentioned seem certainly worthy of recognition, and as far as can be perceived are as distinct as is usually the case in the allied genera. The color of the elytra varies, it is true, as is usual in this part of the *Cerambycidae*, but the characteristics of sculpture and structure upon which the species have been separated, are of more permanent value. The genus will probably prove to be more fully developed in our fauna than in the European.

**T. parallelum** n. sp.—Elongate, moderately convex, parallel, piceous-black, the elytra paler and uniform red-brown, rather dull throughout, the pubescence short, very dense. *Head* densely punctate, the longitudinal frontal groove feeble; antennæ nearly one-half as long as the body, moderately incrassate toward base. *Prothorax* slightly wider than long, the apex and base truncate, the former much the wider; sides broadly, obtusely angulate at the middle; thence feebly convergent to the apex, more strongly so to the base and almost straight; disk longitudinally, distinctly impressed in the middle, finely, very densely punctate, extremely densely so laterally and toward base except along a narrow tumid median line. Scutellum shining, finely, rather densely punctate. *Elytra* two and one-half times as long as wide, about one-fourth wider than the prothorax, the apex obtusely and abruptly rounded. *Legs* moderate in length, rather densely pubescent. Pygidium triangular, with the apex subtruncate. Length 12.0–14.0 mm.; width 3.3–3.8 mm. ♀.

Colorado; New Mexico.

Represented by three females which agree perfectly among themselves. *Parallelum* slightly resembles *cinnamopterum*, but differs in its larger size, more elongate elytra and in the characters given in the table; it is more southern in habitat than *cinnamopterum*, which is represented before me by both sexes from Canada and



New Hampshire. In the male of *cinnamopterum* the pronotal punctuation is still sparser than in the female.

**T. schwarzianum** n. sp.—Robust, the elytra somewhat depressed, piceous-black and rather dull throughout, the pubescence short and dense. *Head* moderately densely and somewhat unevenly punctate; antennæ nearly one-half as long as the body, the second joint nearly two-thirds as long as the third, the latter feebly swollen toward apex. *Prothorax* but little wider than long, the apex wider than the base, both truncate; sides broadly, strongly arcuate, becoming convergent and straighter toward base and apex; disk constricted just before the base, rather strongly, deeply punctured throughout, the punctures generally separated by about twice their widths but denser laterally and toward base, with a more or less narrow uneven impunctate area toward base, which is not at all tumid. *Elytra* not more than twice as long as wide, in the middle nearly one-half wider than the prothorax, slightly dehiscent near the apex and obtusely subtruncate; sides parallel and broadly arcuate; disk with indistinct traces of the usual two fine ridges. *Legs* moderate in length. Length 14.0 mm.; width 4.5 mm.

Michigan (Marquette). Mr. Schwarz.

This species somewhat resembles *velutinum*, but differs in its shorter and more robust form, more broadly rounded sides of the prothorax and coarser, sparser pronotal punctuation. It is widely different from *cinnamopterum* in all these characters, as well as in its broader and more parabolic terminal dorsal segment, and much longer antennæ. The description is drawn from the female, and all comparisons are made in the same sex.

**T. parvulum** n. sp.—Parallel, depressed above, black, the antennæ, legs and elytra more or less pale; pronotum highly polished; elytra dull; pubescence short, dense on the elytra. *Head* finely, sparsely punctate, strongly tumid between the antennæ and longitudinally, deeply sulcate; antennæ two-thirds as long as the body, stout, gradually, finely attenuate, the basal joint one-third longer than wide, second but very slightly shorter than the third, obconical. *Prothorax* slightly wider than long, the apex broadly sinuate in the middle, nearly one-half wider than the base, the latter truncate; sides subangulate just before the middle; disk broadly impressed along the middle, constricted just before the base, smooth, highly polished, finely, extremely sparsely punctate, the punctures larger and moderately dense only on the flanks. Scutellum narrow, polished, with a few minute widely distant punctures. *Elytra* parallel, two and one-half times as long as wide, broadly rounded at apex near which they are dehiscent, each elytron rounded; sides straight; disk not wider than that of the prothorax, with vague traces of the usual fine ridges. *Legs* short, the hind femora robust. Length 8.0 mm.; width 2.2 mm.



Indiana.

The description is taken from the male. The species resembles *cinnamopterum*, but differs in many characters, chiefly mentioned in the table, but also in its shorter and more robust legs. The punctuation at the sides of the prothorax is coarser and sparser, and the terminal joint of the antennæ is quite different, being shorter and without a well-marked cylindrical process at apex; the basal joint, also, is much shorter, although this latter character is less important.

### HYLOTRUPES Serv.

The following species has been well known in our cabinets for many years, and has given rise to much discussion as to its proper value. It is generally conceded to be a well-marked variety of *ligneus*, but certain characters not heretofore dwelt upon lead me to believe that it is specifically distinct.

**H. litigiosus** n. sp.—Black, shining, the pubescence rather long, sparse; elytra with two transverse fasciæ, one before basal third, the other just behind the middle, both broadly interrupted at the suture and not attaining the lateral margins. Head as in *ligneus*. Prothorax nearly as in *ligneus*, but slightly larger. Elytra parallel in the female, distinctly attenuate from base to apex in the male, subdepressed. Length 9.0–12.0 mm.; width 3.0–4.3 mm.

California.

The principal distinctive features of this species, apart from color, are the following:—

1—The prothorax is relatively larger and the elytra distinctly narrowed from the humeri to the apex in the male, the latter being shorter and nearly parallel in the corresponding sex of *ligneus*.

2—The elytral pubescence is longer and rather finer, and the punctures do not become so decidedly finer and closer toward apex, this character applying more especially to the male.

3—The intermediate tarsi of the male of *ligneus* are robust or subdilated, with the second joint about as wide as long, while in the same sex of *litigiosus* they are slender, with the second joint fully one-half longer than wide; corresponding differences are observable also in the anterior tarsi of this sex, the second joint being strongly transverse in *ligneus*, and scarcely wider than long in *litigiosus*.

It is difficult to believe that these differences merely indicate varietal modification, especially as they are confirmed by ample

series in my cabinet. *Ligneus* is found throughout the United States, and is equally abundant in California, while *litigiosus* is confined as far as known to the latter locality.

### PHYMATODES Muls.

This genus is not separable from *Callidium* by any decided modification of the legs, sterna or trophi, and depends for its validity almost entirely upon habitus; the latter may however often become more important, as a generic character, than the modification of any special organ, as is apparently evidenced in the present case.

In *Phymatodes* the eyes are singularly inconsistent in degree of emargination, the two lobes being generally connected by a rather wide faceted band, but in some species, as *varius*, this band or isthmus becomes very narrow, bearing a single line only of somewhat coarser facets, and in *amœnus* almost entirely disappear, the eyes being as completely divided as in *Tetropium*. Thus a character, apparently important in the *Asemini*, becomes here quite valueless.

**P. obliquus** n. sp.—Oblong, subparallel, rather depressed, black throughout, the coxæ alone pale testaceous, moderately shining, each elytron with two narrow fasciæ, oblique toward the suture, the anterior at basal third feebly and posteriorly so, the posterior at apical fourth anteriorly and strongly. *Head* somewhat finely, confusedly punctate; antennæ in the male slightly longer than the body, slender, but slightly stouter toward base, the second joint less than one-half as long as the third, the latter slightly longer than the fourth and a little shorter than the fifth, in the female more than three-fourths as long as the body. *Prothorax* very slightly wider than long; apex and base truncate, the former slightly the wider; sides arcuate; disk widest at about the middle, finely punctate, the punctures dense and scabrous laterally, very sparse toward the middle. *Elytra* feebly narrowed from base to apex, and, at base, but little wider than the prothorax in the male, parallel and much wider than the latter in the female, finely, very densely punctate, much more sparsely so in basal third. *Legs* long, with the femora strongly pedunculate and clavate in the male, shorter and a little more slender in the female. Length 7.2–7.6 mm.; width 2.3–2.5 mm.

California (Santa Clara Co.). Mr. Harford.

The three specimens represent a species allied to *varius*, but differing in the much finer, sparser punctuation of the pronotum, denser punctures of the elytra, with shorter finer pubescence, longer antennæ and much more oblique posterior fasciæ.

This species bears no resemblance to *decussatus* of which I have

a large series; the body is more robust, the femora more clavate, and the antennal joints much more elongate.

**CHROTOMA** n. gen.

Body elongate, densely pubescent, the elytra with small denuded spots. Head not quite vertical, the front feebly concave between the antennæ, longitudinally and finely sulcate, divided from the epistoma by a rather fine but distinct sulcus; eyes deeply emarginate, large, coarsely faceted; palpi slightly unequal, elongate, slender, the last joint elongate, nearly parallel, the apex minutely, transversely truncate; antennal tubercles slightly and obtusely prominent; antennæ (female) two-thirds as long as the body, the third joint very long, slender, slightly enlarged near the apex, three-fourths longer than the fourth, the latter slightly shorter than the fifth, joints five to eleven subequal in length, compressed, the edges very acute, the flat sides feebly swollen along the middle, the apex acutely angulate and very prominent but not spinose internally, tenth joint slightly shorter than the ninth or eleventh, the latter with a small conical apical process. Prothorax without lateral spine and with five dorsal callosities. Scutellum acutely triangular. Elytra with a stout acute sutural spine. Front coxal cavities angulate externally, separated by a narrow but distinct prosternal lamina. Middle coxæ distinctly separated, the cavities open externally. Metathoracic episterna moderate in width, scarcely visibly narrowed from base to apex. Legs short, slender, the basal joint of the hind tarsi longer than the two following combined.

This genus, together with *Brothylus* and *Osmidus* of LeConte and *Perilasius* Bates, constitutes a group of species which is very difficult to treat; they are all allied to the European *Hesperophanes*. *Chrotoma* differs from *Brothylus* and *Osmidus* in the peculiar elongate subparallel form of the last joint of both palpi, and from *Perilasius*, to which it is probably more closely allied, in the slender, almost parallel femora, absence of lateral thoracic spine in the female, and very different disposition of the dorsal callosities, apparently also in the form of the terminal palpal joints.

**C. dunniana** n. sp.—Parallel, moderately, evenly and cylindrically convex, piceous-black throughout, the antennæ and legs concolorous, the elytra with a marginal and discal vitta of pale rufo-testaceous, feebly evident through the dense vestiture and which become more distinct toward base; pubescence moderate in length, coarse, recumbent, very dense throughout the body and legs, pale grayish-white, the small elytral denudations bearing long erect flying hairs, the latter also present rather densely on the prothorax and sparsely on the legs and toward the base of the antennæ. Head three-fourths as wide as the prothorax, the antennæ clothed with fine recumbent ashy pubescence toward base, which becomes slightly darker and excessively minute

and dense toward apex. *Prothorax* very slightly wider than long, the base and apex equal, truncate, the sides evenly and rather strongly arcuate; disk with four small denuded callous spots, which are granulato-rugose but not elevated and arranged in a transverse arc at about the middle of the length, the fifth slightly more elongate-oval on the median line at basal third; on each side of the latter there is also visible a minute callus, which is probably not constant, the median callus slightly impressed and polished. *Elytra* about one-fifth wider than the prothorax, parallel, the sides straight, the apex abruptly, broadly rounded, subtruncate in the middle; disk with fine, rather dense punctures, almost completely concealed by the vestiture, the denuded spots small, numerous, arranged without order, smooth, polished and flat. Length 16.5 mm.; width 4.3 mm.

Texas (El Paso). Mr. G. W. Dunn.

The vestiture is longer, coarser and denser than in *Brothylus*, and almost completely conceals the sculpture. The species is represented by a single female.

#### ELAPHIDION Serv.

*Hypermallus* Lac.; *Aneflus* Lec.

The following species belongs near *irroratum* and *mucronatum*, but has the outer joints of the antennæ strongly and finely carinate along the middle of the flat sides, being thus a highly typical member of the group of species generically separated by Dr. LeConte under the name *Aneflus*; it will be noticed that the outer joints of *irroratum* are also strongly carinate. In fact *Aneflus* not only cannot be regarded as a genus, but apparently does not form even a distinctly marked group, the tendency to carination being apparent in the majority of species and to a very variable degree, so that it is impossible to assign any limits to the group.

**E. arizonense** n. sp.—Form as in *irroratum*, castaneous throughout, scarcely more shining than *mucronatum*; pubescence very short and sparse, finely and rather sparsely marmorate on the pronotum and elytra with small irregular patches of denser pale yellowish pubescence, four of the spots of the pronotum forming a transverse row just before the middle. *Head* coarsely, densely punctate; antennæ (male) about two-fifths longer than the body, stout, third and fifth joints equal in length, the fourth distinctly shorter, three to five strongly spinose internally, the remainder with a small inner and outer spine at apex, joints eight to eleven with a fine strong median carina along their compressed sides. *Prothorax* very nearly as long as wide; apex and base subequal, truncate; sides broadly, very obtusely subangulate at or just behind the middle; disk with a small, elongate, almost impunctate median callus just behind the middle, and a subcallous line at lateral fourth



extending from apical two-fifths to the base, which is more coarsely punctate and more pubescent; other regions dull, coarsely punctate, the punctures densely crowded and themselves finely densely punctate, forming an intricate but coarse sculpture. Scutellum densely pubescent. *Elytra* a little less than three times as long as wide, at base distinctly wider than the prothorax; sides feebly convergent from base to apex, the latter truncate, the outer spine very short and broadly obtuse, the sutural short, narrower and more acute; disk sparsely punctate, the punctures very coarse toward base but fine in apical half. Under surface nearly as in *mucronatum*, the legs longer and the femora much stouter in the male, not spinose; posterior tibiæ carinate as in *irroratum*. Length 21.0–23.0 mm.; width 5.6–5.8 mm.

#### Arizona.

The two specimens, which are from the Levette cabinet, are both males. Although by the characters given for *Aneflus*, this species should be placed near *protensum*, I cannot recommend that it be withdrawn from the neighborhood of *irroratum*, and if it is transferred to *Aneflus*, *irroratum* must go also; but in truth there is no such group in nature as *Aneflus*, and it should therefore be suppressed and the species returned to *Elaphidion*.

**E. levettei** n. sp.—Elongate, very slender, parallel, dark rufo-castaneous, shining, the pubescence silvery-white, not at all maculate on the prothorax, arranged in four even parallel vittæ on each elytron, which do not quite attain the apex, and which are separated by narrower, very sparsely pubescent lines, also with a series of small widely separated denuded spots on each side of the suture. *Head* rather coarsely, densely punctate; antennæ wanting in the type. *Prothorax* much longer than wide, the apex subtruncate, distinctly narrower than the base; sides feebly swollen just behind the middle, thence feebly convergent and nearly straight to the apex, and parallel and feebly, broadly sinuate to the base; disk very coarsely, deeply, densely punctate, the punctures tending to coalesce transversely at the sides, with a small elongate very uneven impunctate area at the middle. Scutellum densely white, small, the pubescence not at all parted along the middle. *Elytra* fully three times as long as the head and prothorax together, at base two-fifths wider than the latter, each elytron very narrowly truncate at apex, and with two subequal slender and well-developed spines; sides nearly straight, very feebly convergent from base to apex; disk sparsely punctate, the punctures very coarse toward base, gradually rather fine toward apex, the dense pubescence of the vittæ not borne from the punctures, but from almost invisible punctuation of the flat interspaces, each of the sparsely pubescent lines having an extremely widely spaced row of coarser punctures, each bearing a long flying hair, one of the latter borne also from each of the small sutural denuded spots. *Legs* rather long, the femora very slender, not spinose at apex; tibiæ and tarsi wanting in the type. Length 18.0 mm.; width 3.5 mm.



Arizona.

A single mutilated male from the Levette cabinet.

This species would almost seem to be generically distinct from *Elaphidion*, but there are no characters relating to the under surface by which it can be separated. The form of the body and size are almost exactly as in *subpubescens*, near which it may be placed for the present.

### **RHOPALOPHORA** Serv.

The following species is allied to *longipes* but differs in its broader form :—

**R. meeskei** n. sp.—Elongate, subparallel, deplanate above, black throughout, the prothorax above and beneath rufo-ferruginous; integuments dull and strongly alutaceous. *Head* somewhat coarsely, deeply punctate; antennæ one-half longer than the body in the male, scarcely longer than the latter in the female, very slender, filiform, the basal joint much thicker. *Prothorax* but very slightly longer than wide; base broadly emarginate, scarcely one-half wider than the apex; sides strongly arcuate at basal third, thence convergent anteriorly; disk moderately constricted laterally at the apex and just before the base, broadly, feebly biimpressed, the impressions joined by a short transverse impression, the pubescence yellow, forming two broad longitudinal lines. *Elytra* nearly as in *longipes*, but more finely and densely cribrate. *Legs* as in *longipes*. Length 7.5–8.4 mm.; width 1.7–1.9 mm.

New Mexico (Las Vegas). Mr. H. Meeske.

In *longipes* the form is very slender, the prothorax much longer than wide, truncate at base, with the punctures extremely fine and sparse, while in the present form the punctures are quite coarse and distinct. In *longipes* the pronotum is not at all impressed, and the lines of extremely short fine pubescence are very narrow.

The species of *Rhopalophora* within our limits may be recognized as follows :—

Pronotum impunctate; large species, 12 mm. in length .....**laevicollis**

Pronotum punctate; smaller species, not exceeding 9.5 mm. in length.

Pronotum not rugulose.

Prothorax narrow, truncate at base, not impressed dorsally...**longipes**

Prothorax broader, feebly biimpressed dorsally, broadly, strongly emarginate at base; form more robust .....**meeskei**

Pronotum transversely plicate and rugulose .....**rugicollis**

The true *longipes* is represented before me by a good series from Indiana.

**CROSSIDIUS** Lec.

The species of this genus with tuberculate sides of the prothorax may be easily distinguished as follows:—

Prothorax more or less strongly transverse, very densely, confluent punctured and densely pilose.

Antennæ of the male rather short, never much longer than the body, those of the female very short and stout, with the joints scarcely more than twice as long as wide.

Elytral punctuation very coarse, becoming slightly finer toward apex, the punctures always distinctly separated.....**punctatus**

Elytral punctuation finer, becoming extremely dense toward apex.

**testaceus**

Antennæ of the male very long and slender, much longer than the body, those of the female moderate in length, slender, with the joints three or four times as long as wide.

Antennæ and legs pale; posterior tarsi short and slender; elytral punctures coarse, always distinctly separated.....**intermedius**

Antennæ and legs black or piceous-black; posterior tarsi longer and much stouter.

Elytral punctures fine and very dense, coarser toward base.

**longipennis**

Elytral punctures very coarse, nearly as in *punctatus*, but much denser.

**crassipes**

Prothorax much less transverse, coarsely, deeply punctate and shining, the punctures all distinctly separated.

Antennæ of the male much longer than the body.

Elytra rather finely and very densely punctate, the elytral base and suture throughout black.....**hirtipes**

Elytra very coarsely, sparsely punctate, with a narrow fusiform black area at the suture, scarcely ever extending as far as basal fourth.

**nitidicollis**

Antennæ of the male much shorter, never notably longer than the body; elytral punctures very coarse toward base, the disk with a broad black sutural area, which is usually angulate anteriorly, sometimes attaining the base.....**pulchellus**

The posterior legs are notably longer than the four anterior throughout the genus, as usual in this part of the family.

**C. longipennis** n. sp.—Elongate and slender, the female more robust, oblong and parallel, pale brownish-testaceous throughout, the legs, antennæ, a more or less narrow fusiform sutural line not closely approaching the base, and the pronotum except laterally, black; integuments moderately shining; pubescence fine, long and very dense on the pronotum, shorter but dense on the elytra. *Head* rather small; antennæ (male) nearly one-half longer than

the body, the third joint as long as the prothorax, (female) two-thirds to three-fourths as long as the body, slender, not distinctly compressed, the intermediate joints from three and one-half to four times as long as wide. *Prothorax* from one-half (male) to nearly once (female) wider than long, the lateral tubercle strong, the apex quite distinctly narrower than the base; disk extremely densely punctate, a very short narrow line in the middle usually more or less impunctate. *Elytra* at base as wide as the prothorax, each elytron narrowly truncate at apex and obtusely but very distinctly angulate externally; disk of each with the usual three fine lines, rather finely, very densely punctate toward apex, the punctures still dense but coarser toward base. Length 15.0–19.0 mm.; width 4.4–5.7 mm.

#### New Mexico.

Related to *intermedius*, but larger and with much finer, denser punctuation, and black legs and antennæ. In *intermedius* the elytra are rounded behind and not truncate and angulate or even prominent externally as in *longipennis*; this is an unusual character in the present genus, but may be perceived also to a less degree in *hirtipes* Lec.

Four specimens from the Levette cabinet.

**C. crassipes** n. sp.—Robust, subparallel, black to piceous-black throughout, the elytra and entire abdomen pale brownish-testaceous; lustre of the elytra rather strongly shining as in *punctatus*; pubescence long, dense and pilose on the pronotum, rather long subrecumbent dense and conspicuous on the elytra, pale throughout. *Head* rather small, the antennæ (male) very long and slender, much longer than the body, the third joint slightly shorter than the prothorax. *Prothorax* coarsely, extremely densely punctate, with a small indefinite median spot which is sparsely punctate; lateral tubercles moderate; disk (male) one-half wider than long, the apex distinctly narrower than the base. *Elytra* at base distinctly wider than any part of the prothorax, two and one-third times longer than wide, rounded behind, each elytron very narrowly feebly sinuate at the suture; sides rather strongly convergent from base to apex; disk very coarsely punctate, the punctures becoming smaller but extremely dense toward apex, the three fine lines distinctly traceable. *Legs* black, the anterior and intermediate very short, with the tarsi dilated, the posterior much longer, with the tarsi two-thirds as long as the tibiae, robust, the second joint nearly one-half longer than wide. Length 14.0 mm.; width 4.5 mm.

#### Washington State.

A single male example from the Levette cabinet. This species is intermediate between *punctatus* and *intermedius*, possessing the black legs and antennæ and robust tarsi of the former, and the long slender antennæ of the latter; it is however abundantly distinct from either. The male is much stouter than the corresponding sex

of *intermedius*, and, in the latter, the posterior tarsi are very short but slender, with the second joint not longer than wide.

**C. nitidicollis** n. sp.—Slender, strongly convex, subcylindrical, strongly shining throughout, intense black, the median parts of the metasternum and the abdomen pale rufous; elytra very pale flavate, with a slender fusiform sutural space black; pubescence rather short and sparse, slightly longer and more erect on the pronotum. *Head* small; antennæ (male) fully one-third longer than the body, slender. *Prothorax* two-fifths wider than long, strongly convex and coarsely, not very densely punctate, the apex truncate, much narrower than the base, lateral tubercle small but distinct. *Elytra* two and three-fourths times longer than wide, at base equal in width to the widest part of the prothorax, the sides very feebly convergent thence to the apex, each elytron narrowly and almost evenly rounded behind; disk very coarsely, deeply punctate, the punctures well separated toward base and becoming finer but not much closer toward apex. *Legs* slender; hind tarsi three-fourths as long as the tibiæ, with the second joint a little longer than wide. Length 10.5–12.5 mm.; width 3.3–3.8 mm.

Arizona (Tuçson). Mr. Wickham.

This species is allied somewhat to *pulchellus*, but differs conspicuously in many characters as detailed in the synoptic table; in addition it may be noted that the prothorax is larger and longer than in *pulchellus*, with the extremely slender and acute lateral prolongation of the basal angles much more conspicuous. It is represented before me by four specimens all of which are males. The male appears to be more abundant than the female in all of the species of this genus.

### **SPHÆNOTHECUS** Dup.

*Ischnocnemis* Lec. nec Thoms.

The Mexican species allied to this genus form a very perplexing mixture, and I have several in my cabinet which cannot be satisfactorily assigned to any of the described genera. The parts most useful in generic identification are the mesosternum, posterior tarsi and scutellum, but the last is probably much the least important of the three. The presence or absence of raised ivory vittæ is, as remarked by Mr. Bates, a character of subordinate import, and in *Sphænothecus* we have species with simple elytral disk like *suturalis*, others having raised costæ, and others again with simple narrow pubescent vittæ.

*Sphænothecus* is allied to *Mannophorus*, but differs in its protu-



berant and anteriorly vertical mesosternum and generally longer, more finely attenuate scutellum. The true *Ischnocnemis* has the mesosternum non-protuberant.

Our three species may be separated by the following table :—

Elytra with raised ivory vittæ.....	<b>bivittatus</b> Dup.
Elytra simple, without raised lines or pubescent discal vittæ, the suture alone narrowly and very evenly vittate, the vitta composed of extremely dense white pubescence.	
Piceous-black, the prothorax and femora rufous ; elytral punctuation coarse, very sparse, evenly distributed, the pronotal punctures and pubescence not denser laterally.....	<b>suturalis</b> Lec.
Pale rufous throughout, the tibiæ and tarsi nigrescent ; antennæ black, in the male fully twice as long as the body, in the female about as long as the body. Prothorax more transverse and less strongly narrowed anteriorly than in <i>suturalis</i> , the pubescence very dense toward the sides and apex as well as along the base. Elytra nearly as in <i>suturalis</i> , but more rapidly narrowed from base to apex, the punctuation coarse, sparse toward the sutural vitta, but thence dense, rugulose and intermingled with smaller punctures in a wide uneven longitudinal area extending almost to the sides, the pubescence longer and denser than in <i>suturalis</i> . Length 11.0–12.5 mm.; width 3.5–3.8 mm.....	<b>rubens</b> n. sp.

The male antennæ are always much shorter in *suturalis* than in *rubens*, and are generally not more than two-thirds longer than the body, the eyes also are more narrowly separated dorsally than in *rubens*. The three species agree in the form of the elytral apices which are strongly, very acutely dentiform but scarcely spinose externally. *Rubens* was obtained in great abundance by Mr. Dunn in various parts of southern Arizona and California, and *suturalis* by Mr. Wickham at Tucson.

#### **STENOSPHEUS** Hald.

With the exception of *notatus* our species seem to be quite local in distribution ; the following belongs near *lepidus* Horn :—

**S. longicollis** n. sp.—Slender, elongate, subparallel, polished, the elytra slightly less so than the prothorax and minutely evenly reticulate ; body piceous-black, the femora red, piceous near the apex ; prothorax red, clouded with piceous toward the sides ; pro- and mesosterna red ; pubescence coarse, moderate in length, sparse. *Head* finely, longitudinally canaliculate ; antennæ (male) very slender, fully three-fourths longer than the body, joints three to five spinose internally at apex. *Prothorax* distinctly longer than wide ; sides broadly, evenly arcuate, gradually convergent anteriorly and



abruptly so near the base which is much wider than the apex; disk widest at basal third, with a few fine, widely dispersed punctures toward the sides only. Scutellum small, rounded, densely flavo-pubescent. *Elytra* three times as long as the prothorax, and, at the base, one-fourth wider; sides feebly convergent and nearly straight from the humeri to apical fourth or fifth, then gradually more strongly convergent to the apex, each elytron being narrowly truncate, the truncation bisinuate and limited internally and externally by a minute acute dentiform process, which is not sufficiently elongate to be termed spinose; disk rather finely but deeply, sparsely, evenly punctate throughout, the punctures perforate and without trace of definite arrangement. Length 10.0 mm.; width 2.5 mm.

Texas.

A single male, probably received from Mr. Dunn, and without any more definite locality. It differs from *lepidus* in having the entire prosternum in front of the coxæ strongly depressed and coarsely densely punctato-rugulose, with the exception of a wide polished apical margin; in *lepidus* this space is divided by a polished longitudinal elevation, thus forming two depressed areas. *Longicollis* does not appear to be referable to any of the described Mexican species.

#### **XYLOTRECHUS** Chev.

The species *insignis* of LeConte, is remarkable for its pronounced sexual disparity. A few years since I took a series of six specimens from some low alder-like trees near the banks of the Trinity River, in Humboldt Co., California, which upon cursory examination seemed to represent a distinct species near *insignis*. Subsequently I received a number of specimens from other parts of the State.

The Humboldt specimens are uniformly pale in color, with the prothorax large and transversely subquadrate, and the markings indefinite and more or less confused with the ground color by dispersion of the pale hairs; upon close study all of these specimens prove to be males. The female, represented before me by three perfectly homogeneous examples, is black, and has the prothorax narrower and the markings always distinctly and abruptly limited.

Although such striking sexual differences are unusual or altogether unknown in our other species of this genus, it appears to be a more common condition in the allied Mexican genus *Ochræthes* Chev., a seemingly undescribed species of which, represented in my cabinet by a good series, having the markings suffused in the male but distinct in the female.

**THESALIA** n. gen.

This name is proposed for a small species, recently described by Mr. Leng (Ent. Amer., VI, p. 108) under the name *Acmæops lisa*. Briefly, its characters may be expressed as follows:—

Front before the antennæ nearly vertical. Antennæ long and slender, rather approximate and dorsal in their insertion. Eyes moderate, convex, with a small distinct but moderately deep sinuation. Neck strongly constricted, the constriction extending entirely across the dorsal surface. Legs moderate, the posterior tarsi rather short, densely pubescent beneath, the basal joint subequal in length to the next two together.

The genus *Thesalia* should be placed between *Leptalia* and *Encyclops* in our lists, and agrees with the former in most of its characters.

The prothorax differs greatly from either *Leptalia* or *Encyclops*, being long and slender, much longer than wide and narrower than the head, rather coarsely and sparsely punctate and not at all impressed or canaliculate along the middle. In *Encyclops cærulea* both the head and pronotum are dull and densely covered with a reticulation formed by fine strongly elevated lines.

I have before me a single representative of *Th. lisa* collected in Marin Co., California, by Mr. Dunn. It does not entirely agree with the description given by Mr. Leng, having the pronotum sparsely punctate toward the middle, without a well-defined impunctate area, the elytra black with the punctures throughout decidedly sparse as well as extremely coarse and deep, and with the sides feebly convergent from base to apex. The hind tarsi have the two basal joints densely pubescent beneath but not as densely so as the third, and are strongly fimbriate along the sides. The specimen here noted is probably the male of the original type, which is without doubt a female.

**CENTRODERA** Lec.

There is before me a specimen which I took on the summit of Mt. Diablo, near San Francisco, which is pale castaneous in color throughout and uniformly and sparsely pubescent. The length is 16.5 mm., and the prothorax is much longer than wide, strongly constricted at basal and apical fourth, with the apex much narrower than the base and the disk broadly, deeply impressed along the middle. The eyes are remarkably large and the antennæ are

slightly longer than the body, with the joints four to eleven pale testaceous toward base and black in apical third. I think that this is probably the male of *C. nevadica* Lec., which was described from a unique female.

### TOXOTUS Serv.

**T. lateralis** n. sp.—Rather short and stout, moderately shining, black throughout the body, legs and antennæ, the abdomen rufo-testaceous and the elytra with a pale narrow marginal vitta which does not quite attain the apex; pubescence short, cinereous, rather sparse, longer but not much denser on the prothorax. *Head* rather finely densely and confluent punctate, broadly tumid between the eyes, the latter rather large and convex; antennæ but just visibly shorter than the body, rather stout, compressed, the fourth joint nearly two-thirds as long as the third and about three-fourths as long as the fifth, the third joint three times as long as wide. *Prothorax* a little longer than wide, strongly constricted near apical third and basal fourth, the apex four-fifths as wide as the base, broadly arcuate; sides angularly tuberculate at the middle; disk finely, densely punctate, the punctures sparser in the apical constriction. *Elytra* at base nearly one-half wider than the prothorax, two and one-half times longer than wide, the sides very strongly convergent from base to apex and nearly straight; each elytron narrowly and obliquely truncate, the truncature straight, the outer angle acute, not rounded, the inner dentiform; humeri rather prominent, less than right, narrowly rounded; disk nearly flat, abruptly perpendicular at the sides, very finely, densely punctate and also with slightly larger widely dispersed punctures. Under surface punctured like the elytra, the abdomen more sparsely. *Legs* slender, moderate in length. Length 13.0 mm.; width 4.0 mm.

California (near San Francisco).

The single male specimen which I took at the summit of Mt. Diablo, represents a species somewhat allied to the eastern *trivittatus* Say (*vittiger* Rand.), but differing in its unusually long, and, at the same time, stout and compressed antennæ. The elytral truncature is as in *trivittatus*, but with the sutural tooth much larger and more conspicuous.

### ANTHOPHILAX Lec.

**A. subvittata** n. sp.—Moderately robust, rather convex, piceous-black; legs and antennæ piceo-testaceous; elytra pale luteo-testaceous, with a broad common sutural and narrow submarginal vitta of piceous-black, the vittæ generally feebly marked and sometimes evanescent; pubescence extremely short and sparse, on the elytra consisting of very minute erect setæ borne from the punctures. *Head* finely, densely punctate, finely canaliculate between the antennæ, the latter three-fourths as long as the body, with the

third joint distinctly longer than the fourth but much shorter than the fifth. *Prothorax* slightly wider than the head and a little wider than long, the apex very slightly narrower than the base, both feebly arcuate; sides strongly, obtusely tuberculate at the middle; disk finely, densely punctate, scarcely at all impressed along the middle where the punctures are sometimes but not always sparser. *Elytra* at base not more than one-third wider than the prothorax, about two and one-third times longer than wide; sides distinctly convergent from base to the apex, which, conjointly, is broadly and evenly rounded; disk very coarsely and sparsely punctate toward base, the punctures becoming gradually fine toward apex and along the suture. Length 9.3–11.0 mm.; width 3.2–4.0 mm.

#### Colorado?

The five specimens before me are without definite indication of locality, but as they are from the Levette cabinet they were in all probability taken in or near the region above stated. These specimens are apparently all males, and the species appears to be related to *tenebrosa*, which is described from a unique female. I do not think however that *subvittata* can be the male of *tenebrosa*, for in that case the general direction of the sexual differences, as shown in *mirifica* by Dr. Horn, would be rather reversed, the elytra in the male of *mirifica* being almost impunctate, while in the female they are very coarsely so.

#### ACMÆOPS Lec.

The series in my cabinet seem to show that *A. subpilosa* is a species entirely distinct from *lupina*. The former is extremely sparsely punctate, the pubescence very easily removable, but denser and persistent in a very narrow line bordering the elytral suture, giving it a narrowly vittate appearance, while in *lupina* there is no indication of this sutural condensation, and the discal punctures are between two and three times as dense, the pubescence being much more persistent.

The species *longicornis* and *ligata* are perfectly identical, and the latter should be regarded as a synonym of the former, not a variety. *Gibbula* is a synonym of *proteus* and not a variety, as it is printed in our lists.

**A. variipes** n. sp.—Rather slender, strongly convex, shining, deep black; antennæ dark brown, with the basal joint darker and blackish; anterior legs throughout and the intermediate and posterior femora feebly and suffusedly near the coxæ only, pale rufo-testaceous; pubescence very short and sparse, longer on the anterior portions. *Head* about equal in width to



the prothorax, flattened above, rather coarsely, extremely densely punctate and dull; sides behind the eyes parallel for a very short distance, then rounded to the neck; tempora shorter than the eye; antennæ very slender, subequal in length to the body, third joint much shorter than the fifth and but slightly longer than the fourth, the fifth thicker toward apex than the others. *Prothorax* slightly wider than long, the apex broadly arcuate, three-fourths as wide as the base; sides strongly but evenly arcuate, sinuate near base and apex; disk narrowly impunctate but scarcely impressed along the middle, rather coarsely, very densely punctate, the punctures generally not in actual contact. Scutellum rather longer than wide, acutely rounded at apex. *Elytra* at base not quite one-half wider than the prothorax, two and one-half times as long as wide; sides rather strongly convergent from base to apex, the latter narrowly rounded, not at all truncate; disk very coarsely, deeply; not closely punctate, the punctures becoming slightly smaller but not denser toward apex, each bearing a very short coarse hair. *Legs* rather long and slender. Length 8.0–8.8 mm.; width 2.5–3.0 mm.

California (Sta. Cruz Co.).

This species is somewhat allied to *longicornis* and *basalis*, but differs in its shorter, more convex form, much coarser, sparser punctuation, shorter, sparser pubescence, and also in coloration; from *atra* it differs greatly in the parallel sides of the head behind the eyes, in the distinct basal constriction and prominent basal angles of the prothorax, and in its much more crowded pronotal punctuation.

A specimen from Nevada is nearly similar, but has the pubescence still more minute and the elytra parallel and scarcely more than twice as long as wide; this is probably the female of the above-described male.

### **STRANGALIA** Serv.

The sexual characters of this genus form an exceedingly interesting study, as they manifest themselves strongly and in several directions. The fifth segment of the male is sometimes very large, dilated and strongly excavated beneath as in *virilis*, and, to a less degree, *strigosa*; in addition it will be noticed that this segment is also invariably impressed or excavated beneath toward tip in the female as well as the male, and in *sexnotata* the impression is quite as deep in the former as in the latter sex, and involves even more of the surface of the segment.

The community of impressions and excavations of the fifth ventral segment to both male and female is noticeable in many parts

of the Heteromera, and I have alluded to it before under the genus *Blapstinus* (Ann. N. Y. Acad., V, p. 418). It is probable that this fact has a more far-reaching import than may be apparent to us at present.

The antennæ of the male have, on the side at the apex of each of the outer joints, a large elongate-oval depressed area which is glabrous, but over which there are generally scattered a very few coarse spinose setæ. These sensory depressions are usually much less developed in the female than in the male, and are sometimes almost obsolete in that sex; they vary slightly in form and depth in the various species.

I take the present occasion to call attention to a species allied to *sexnotata*, which may be described as follows from the female:—

**S. montana** n. sp.—Moderately robust, rather dull and alutaceous in lustre, pale rufo-testaceous throughout, the tarsi and three or four terminal joints of the antennæ picescent; elytra each with three black spots arranged as in *sexnotata*; pubescence rather short, coarse and sparse. *Head* finely, very densely punctate, a posteriorly angulate area immediately behind the epistoma impunctate and highly polished; epistoma and labrum finely, sparsely punctate and shining; antennæ (female) two-thirds as long as the body, stout, cylindrical, the joints compactly joined toward apex and without trace of sensitive apical areas, third joint one-half longer than the fourth. *Prothorax* fully as long as the basal width, finely, strongly constricted just behind the apex, the latter truncate and less than one-half as wide as the base, the latter broadly bisinuate; basal angles laterally produced, acute and prominent; sides broadly sinuate toward base; disk immaculate, evenly convex, rather coarsely and sparsely punctate. *Elytra* at the humeri quite distinctly wider than the prothorax, nearly three times as long as wide, the sides strongly convergent from the rounded humeri to the apex; each elytron truncate at apex, the truncation but slightly oblique; disk rather coarsely, sparsely punctate. Under surface finely, sparsely punctate and pubescent. Length 12.5 mm.; width 3.5 mm.

New Mexico (Las Vegas). Mr. Meeske.

Immediately distinguishable from the female of *sexnotata* by the truncate apices of the elytra, and stouter antennæ; the antennæ and greater part of the legs are black in *sexnotata*, but two specimens before me from Texas seem to indicate that they may occasionally become pale throughout, this not being a character of great importance. The elytra toward apex are much less dehiscent in *montana* than in *sexnotata*, and the surface in the former is less shining and more finely punctate.

**OPHISTOMIS** Thoms.

The species recently described by Bates (Biol. Cent.-Amer. Col., V, p. 39) as *lævicollis* is represented before me by three specimens, perfectly homogeneous as regards color, and belonging to the variety designated "6" (l. c., page 279). These specimens were formerly included in the Levette cabinet, and are labeled "Arizona." This is therefore one of those tropical species of exceptionally extended northern distribution, of which *Xystropus californicus* Horn, is another notable example.

The elytra in *O. lævicollis* are obliquely and rather widely truncated at apex, the line of truncation straight and the outer angle very acute but not appreciably produced. The elytral punctuation varies considerably in density, but is generally finer and confused toward apex and very coarse and sublineate in distribution toward base. The humeri in the specimens alluded to are clouded with reddish-testaceous. The intermediate tibiæ are quite distinctly clavate.<sup>1</sup>

**LEPTURA** Serv.

A specimen of *nigrella* Say, from Colorado, before me, has the elytra bright red throughout, with the exception of a narrow and even black marginal vitta in apical third.

The three following species appear to be new:—

**L. serpentina** n. sp.—Rather slender and convex, feebly shining, black throughout, the legs and antennæ generally pale; pronotum with the apical and basal margins bright sulphureo-pubescent; elytra each with four transverse bands of the same color, one at the base just behind the scutellum narrowly interrupted at the suture, the second just before the middle, third at posterior third, and the fourth near the apex; under surface clothed with yellow pubescence, the abdominal segments more distinctly so near the apex

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<sup>1</sup> Some time after the above paragraphs were written, I sent one of these specimens to Mr. Bates, and take the liberty of quoting the following lines from the very courteous letter recently received in reply:—

"I have examined your Ophistomis, supposed to be from Arizona, and find it cannot be specifically distinguished from *O. lævicollis*. The punctuation is a little more sparse, but a rather more important difference is the relative greater length of the elytra, and the shorter outer acute angle of the truncature. I do not consider these differences specific, but note them only as some evidence that the specimen comes from a different locality from those recorded in the Biologia, i. e., Oaxaca to Panama."

and sides. *Head* finely, densely punctate; antennæ (male) nearly as long as the body, slender, filiform, the third joint much longer than the fifth, the latter distinctly longer than the fourth, (female) nearly three-fourths as long as the body, with the joints proportioned nearly as in the male. *Prothorax* about as wide as long, campanulate, with the sides inflated and broadly subangulate before the middle, the basal angles acute and strongly produced outwardly and posteriorly; disk almost evenly convex, with a small impunctate vitta near the base, rather strongly and somewhat sparsely punctate in the male, densely so in the female. *Elytra* at base distinctly wider than the prothorax, a little more than twice as long as wide; sides moderately convergent (male), or very feebly so (female); apex narrowly and evenly truncate, the truncation but slightly oblique; disk strongly, rather densely punctate (male), or extremely densely and more finely so (female). *Legs* rather long and slender. Length 7.0–11.0 mm.; width 2.0–3.3 mm.

Idaho.

Greatly resembles *tribalteata* Lec., and differs from that species in much the same way that *nitens* Forst. (*zebra* Oliv.) does from *læta* Lec. The form in the male is more slender than in *tribalteata*, with the elytra less strongly narrowed from base to apex, and with the apical truncation much less oblique; the antennæ are much longer and more slender, and the third joint is distinctly shorter in comparison with the next two; the dorsal punctuation is coarser, deeper and sparser in the male but rather denser in the female, and the transverse bands of the elytra are much narrower. The antennæ are always pale in *serpentina* and intense black in *tribalteata*, and the head and eyes are smaller in the former than in the latter.

**L. haldemani** n. sp.—Slender and rather convex, intense black throughout the body, legs and antennæ, the elytral humeri obliquely red; lustre moderately shining; pubescence short, sparse and inconspicuous. *Head* wider than long, the tempora and base nearly as in *sanguinea*; surface flat, very densely punctate; antennæ (male) nearly as long as the body, rather stout. *Prothorax* much longer than wide, as in *sanguinea*, but much less inflated or subangulate at the middle; disk rather coarsely, deeply and extremely densely punctate, the punctures in close mutual contact, without distinct median impunctate line except very narrowly toward base, the line generally with a very fine impressed stria. *Elytra* between two and three times as long as wide, at base nearly one-half wider than the prothorax, the humeri rounded but rather prominent; sides evenly and rather strongly convergent from base to apex and straight; each elytron narrowly truncate at apex, the truncation slightly oblique and straight or extremely feebly sinuate, the angles obtuse; disk not very coarsely or densely punctate, the punctures deep and perforate toward base, becoming finer and more or less asperate



toward apex, sometimes with traces of two narrow impunctate lines toward base. Under surface very finely and densely punctate, more conspicuously pubescent. Length 9.0–10.5; width 2.5–3.0 mm.

New Mexico.

The two specimens are males, and are from the Levette cabinet. The species is allied to *sanguinea*, but differs greatly in coloration and punctuation, and in the more narrowly and obliquely truncate elytral apices. The red humeral maculation is similar in form to that of *Acmaeops basalis*.

**L. lacustris** n. sp.—Body, legs and antennæ entirely black, the elytra pale brownish-testaceous, sometimes feebly infusate near the apex; lustre moderately shining; pubescence moderately long, very short on the elytra.

*Male*.—Slender, very convex. *Head* wider than long, the sides behind the eyes parallel for a short distance; hind angles right and narrowly rounded; surface feebly convex, densely and rather coarsely punctate; antennæ three-fourths as long as the body, rather stout. *Prothorax* as in *sanguinea*, rather coarsely, deeply, very densely punctate, with a narrow impunctate median line, the punctures nearly but not quite in mutual contact, the interspaces polished. *Elytra* two and one-half times as long as wide, at base one-third wider than the prothorax; sides gradually and distinctly convergent from base to apex, the latter very narrowly and obliquely truncate, the truncation deeply sinuate; disk rather densely and strongly punctate, the punctures becoming slightly finer toward apex. Length 9.0–11.0 mm.; width 2.8–3.6 mm.

*Female*.—Moderately slender, smaller than the male, the upper surface much less convex. *Head* similar in form to that of the male, but with the surface very finely and excessively densely punctate and dull; antennæ scarcely more than one-half as long as the body, very slender. *Prothorax* similar in form to that of the male, but with the surface extremely densely punctate, and without trace of median impunctate line, the punctures scarcely smaller than in the male and very much larger than those of the head. *Elytra* scarcely more than twice as long as wide, at base rather more than one-third wider than the prothorax, the humeri distinctly rounded but much more prominent than in the male; sides almost parallel, feebly convergent toward apex, the apical truncation as in the male; disk very coarsely, deeply, densely punctate, the punctures becoming much finer toward apex, coarser toward base than those of the male. Length 7.8–9.0 mm.; width 2.5–3.0 mm.

Michigan (Marquette). Mr. Schwarz.

This species is allied to *sanguinea* Lec., but differs in the much stouter male antennæ and in the radically different truncation of the elytral apices; the latter in *sanguinea* is rather broad, scarcely at all oblique, and is almost perfectly straight, the angles being blunt; in *lacustris* it is very much narrower, oblique, deeply sinuate and with the angles, especially the exterior, very acute and prominent,

nearly as in *canadensis*. The sexual differences throughout the body are extremely and unusually marked, and in the series before me, the females are decidedly smaller than the males.

### IPOCHUS Lec.

The chief differences between this genus and *Moneilema*, apart from the tribal characters relating to the support of the labrum and size of the body, are the shorter and broader front, presence of long tactile flying hairs on the body legs and antennæ, and the great divergence in form of the sexes. The last of these is one of the most remarkable of the generic peculiarities of *Ipochus*, the male being slender, strongly convex, with oval elytra, subglobular prothorax and constricted neck, and the female more robust, subparallel, the prothorax transversely subquadrate and the neck scarcely at all constricted, the head being more deeply inserted. It will be observed therefore that the sexual differences are directly the reverse of those of *Moneilema*, in which, when these are at all pronounced, the male is more robust parallel and compact than the female, and with a larger prothorax.

The following species are indicated by the material at hand :—

Elytra with three transverse, irregular and more or less narrow fasciæ, the first near the base, the second at apical third (viewed vertically), and the third on the apical declivity, extending semi-circularly from the side margins, crossing the suture midway between the second band and the apex; recumbent pubescence rather sparse; pronotum very coarsely, deeply and not closely punctate, with two pairs of small discal pubescent spots. Elytra broadly, deeply sinuate at apex when viewed along the longitudinal axis of the body. Length 4.5 mm.; width 2.0 mm. (San Diego.).....**fasciatus** Lec.

Elytra with two more or less narrow transverse fasciæ, which are irregular and zigzag in form, the first at the base, the second at apical fourth (viewed vertically); in addition a small elongate-oval sutural spot near the apex on the declivity. Body sparsely pubescent, the pronotal punctures coarse, moderately close, distinct, the integuments shining. Head finely, sparsely punctate; antennæ about as long as the body, the outer joints feebly annulated at base. Prothorax one-fourth wider than long, the sides rounded, more convergent toward base, the latter much narrower than the apex; discal pubescent spots evanescent, the fine pubescence very sparse, short and inconspicuous. Elytra one-third longer than wide, in the middle one-third wider than the prothorax; sides rounded, the apical portion of the disk perpendicular and deep; apex not appreciably emarginate when viewed longitudinally. Abdomen sparsely pubescent.

Length 7.0 mm.; width 3.4 mm. (female); in the male the length is 5.0-7.0 mm.; width 1.6-2.2 mm. (Los Angeles.)....**subnitidus** n. sp. Elytra each with two transverse fasciæ, the first subbasal, the second very wide, with uneven margins, extending from the middle to the apex (viewed vertically) and with a prolongation posteriorly along the suture. Body robust, compact, the head and pronotum extremely densely pubescent, the vestiture completely concealing the surface lustre and punctation, the elytra slightly shining and less densely pubescent. Head rather strongly, somewhat closely punctate; antennæ nearly as long as the body, the outer joints scarcely annulate at base. Prothorax fully one-third wider than long, the base much narrower than the apex; disk with two pairs of small discal pubescent spots, and another which is median and more posterior. Elytra two-fifths longer than wide, behind the middle but little wider than the prothorax; apex broadly, feebly, subangularly emarginate (viewed longitudinally); sides very feebly arcuate; disk finely, very sparsely punctate. Abdomen densely pubescent. Length 7.5 mm.; width 3.2 mm. (San Diego.).....**pubescens** n. sp.

The species above identified as *fasciatus* agrees in every particular with the type in the LeConte cabinet.

All the characters of the above diagnoses are taken from the female, except when otherwise noted. Two males which I obtained from the blossoming branches of the Monterey pine, near the town of that name, seem to indicate another species, which the absence of the female prevents me from describing at present. Another specimen from San Diego, resembles *subnitidus*, but is still more shining and sparsely pubescent, and has a large impunctate median area of the pronotum, which is finely and deeply canaliculate; it is probable also that this is a distinct species, but more confirmatory material is necessary.

#### **MONEILEMA** Say.

The following species belongs to the subgenus *Collapteryx* as defined by Dr. Horn:—

**M. spinicollis** n. sp.—Moderately robust and convex, the elytra subcarinate at the sides toward base, black, rather strongly polished, glabrous. *Head* with a few fine punctures beneath the eyes and antennæ, impunctate toward the middle, the front separated from the epistoma by a deep transverse impression; antennæ three-fourths as long as the body, with the fourth joint alone annulate at basal two-fifths; scape very long and thick, with a few fine widely dispersed punctures. *Prothorax* strongly transverse, from one-third to nearly one-half wider than long, the base and apex equal in width, feebly arcuate; sides parallel, feebly arcuate, the spine long, acute, directed upward and backward; disk evenly convex, with a more or less incomplete and very

fine stria along the middle, the punctures very fine and widely dispersed, but coarse and deep along the basal margin and on the flanks beneath the spine. *Elytra* oval, from two-thirds to once longer than wide, the sides arcuate but sometimes almost straight and parallel, scarcely wider than the prothorax in the male but distinctly so in the female, very coarsely and sparsely punctate in scarcely more than basal half. Posterior tarsi as in *armata* in form, but with the second joint densely spongy-pubescent throughout, except along a median line which becomes broad at base, the basal joint sometimes with a small spot of dense yellow spongy-pubescence at each apical angle. Length 23.0–29.0 mm.; width 9.0–11.5 mm.

#### Arizona.

Four specimens from the Levette cabinet. This species differs from *gigas* in its much shorter and more transverse prothorax and smaller size, and from *armata* in the much longer and thicker antennal scape, longer thoracic spines and in the more spongy pubescent second joint of the hind tarsi. It should be placed immediately after *gigas* in the catalogue.

The ashy pubescence of the fourth antennal joint forms a narrow band extending from basal sixth or seventh of the length to about the middle.

### PSENOCERUS Lec.

The two species contained in my cabinet may be recognized as follows:—

- Elytra* each strongly tumid on the disk near the base; body ferruginous, the *elytra* each with an oblique subinterrupted fascia at the middle and a broader transverse spot near apical third white, the portion between the two fasciæ blackish ..... **supernotatus**
- Elytra* but very feebly tumid near the base; body piceous-black throughout, the *elytra* with a transverse interrupted fascia of white pubescence at apical third..... **tristis**

In both of these species the scutellum is clothed with dense white pubescence.

**P. tristis** n. sp.—Form nearly as in *supernotatus*, feebly shining; pubescence rather sparse and inconspicuous. *Head* finely but deeply and very densely punctate; antennæ scarcely three-fourths as long as the body, cylindrical, the third and fourth joints elongate and subequal, joints five to eleven shorter and becoming still shorter near the apex, the joints compactly joined. *Prothorax* slightly wider than long, strongly constricted near the base; apex much wider than the base; sides nearly parallel in apical two-thirds; disk evenly convex, rather coarsely, deeply, extremely densely punctate. *Elytra*



parallel, distinctly wider than the head and prothorax, and a little more than twice as long as wide; humeri right and rather prominent; apex evenly rounded; disk coarsely punctate, the punctures not quite in mutual contact, and, between the fascia and extreme apex, becoming very sparse. Under surface finely, densely punctate throughout and finely, inconspicuously pubescent. *Legs* moderate; tarsi short and stout. Length 4.5 mm.; width 1.2 mm.

#### New Mexico?

A single representative, the habitat of which is somewhat doubtful. The species is easily distinguishable from *supernotatus* by the characters given in the table. The basal tubercles of the elytra, so distinct in *supernotatus*, are barely perceptible in *tristis* as broad and feeble swellings of the surface.

### MONOCHAMUS Serv.

**M. obtusus** n. sp.—Stout, subparallel, moderately convex, brown throughout and marmorate nearly as in *titillator*. *Head* deeply angularly impressed between the antennæ; front shining, sparsely pubescent, finely, sparsely and unevenly punctate; antennæ (male) two-thirds longer than the body, slender, not at all annulate, (female) but slightly longer than the body, distinctly annulate. *Prothorax* slightly wider than long, the lateral spines well developed; disk shining, coarsely, confluent punctate, transversely rugulose anteriorly, with an oblong impunctate median area; pubescence moderately conspicuous, feebly and minutely marmorate laterally, with two distant, discal spots before the middle. Scutellum glabrous, pubescent at base especially toward the sides. *Elytra* scarcely more than twice as long as wide, parallel in basal half in the male and basal two-thirds in the female, at base distinctly wider than the prothorax, the apices individually rounded, broadly so in the female, a little less broadly in the male; disk very coarsely punctato-rugulose toward base, sparsely and more finely punctate thence to the apex. *Abdomen* densely pubescent, the pubescence whitish and finely, unevenly marmorate or nucleated. *Legs* rather short and moderately slender. Length 13.0–19.0 mm.; width 4.7–6.8 mm.

#### California.

This species is not at all closely related to any other hitherto described. In general it resembles *titillator*, but is smaller, shorter and broader, with the apical angles of the elytra broadly rounded even in the males. In the recent table given by Dr. Horn it may be placed between *scutellatus* and *confusor*. The scutellum, which is pubescent only toward the sides of the base, will readily serve to distinguish it from any other of our species, and from *oregonensis* it may be known by its rounded elytral apices, scutellum and coloration. It is represented before me by a good series of six specimens collected near the northern boundary of the State.

**LEIOPUS** Serv.

**L. setipes** n. sp.—Moderately robust, convex, piceo-testaceous, densely clothed with dark luteous pubescence, devoid of fasciculate tufts of coarser hairs, and with an anteriorly angulate white fascia behind the middle, also a very feebly defined paler oblique line on each elytron near the apex. *Head* extremely minutely, densely punctate when denuded; eyes separated above by a distance which is scarcely more than one-half as great as in *wilti*; antennæ slender, two-fifths longer than the body, nearly as in *wilti*. *Prothorax* one-half wider than long, four-fifths as wide as the elytra, rather finely and closely punctate, the pubescence very indefinitely variegated; lateral spine short but not at all blunt, just behind the middle, nearly as in *wilti*, but slightly more anterior in position. *Elytra* three-fourths longer than wide; sides nearly parallel in basal two-thirds, then oblique to the apex, each elytron narrowly and obliquely truncate; disk coarsely, deeply punctate when denuded, each elytron with a large lateral blackish semi-denuded spot, and three costiform lines along which the pubescence is more prominent, the recumbent pubescence unusually long; erect hairs short and very sparse. Under surface dark plumbeous, densely pubescent. *Legs* rather short and stout, throughout nearly as in *wilti*, but with long flying hairs on the tibiæ, especially pronounced on the posterior. Length 7.0 mm.; width 2.8 mm.

Texas (El Paso). Mr. Dunn.

This species in general appearance is intermediate between *alpha* and *wilti*, but is not closely related to any other form, the long flying hairs of the tibiæ being a very unusual character in *Leiopus*. In the present arrangement of the species it may be placed just after *punctatus*.

**L. mimeticus** n. sp.—Rather robust and convex; integuments rather pale rufo-testaceous, the pubescence short, luteo-cinereous, scarcely at all variegated on the prothorax, the elytra with very minute sparsely placed black fasciculate tufts, which are usually arranged in four or five rows on each, and, in addition, with an elongate blackish semi-denuded spot at the side, and an oblique black fasciculate and usually interrupted line near posterior third. *Head* extremely minutely, moderately densely punctate; eyes separated above as in *punctatus*; antennæ one-half longer than the body, annulate with black at the apex of each joint as usual. *Prothorax* rather short, three-fourths wider than long and four-fifths as wide as the elytra, evenly convex and pubescent, not distinctly punctate, the lateral spine very short and broad but not in the least rounded, situated just before basal third. *Elytra* four-fifths longer than wide, the sides subparallel in basal two thirds, then oblique to the apex, each elytron narrowly and obliquely sinuato-truncate; disk coarsely, deeply punctate when denuded. Under surface very finely, densely, uniformly pubescent. *Legs* short, maculate, the femora strongly clavate; tibiæ without long flying hairs; tarsi short and robust. Length 4.5–6.5 mm.; width 1.8–2.6 mm.

Texas; District of Columbia.

A small, robust and convex species, with unusually short, even and pale pubescence, and bearing a striking resemblance to *Leptostylus biustus*. It is rather closely related to *Leiopus crassulus*, from Lower California, but is well distinguished by its more elongate and convex form, longer and denser pubescence, and especially by the form of the elytral apices, which are here obliquely and strongly truncate, but evenly rounded in *crassulus*. This species has been described by Dr. Horn (Tr. Am. Ent. Soc., VIII, p. 125), and somewhat doubtfully referred to *L. crassulus*, but I think that the form of the elytral apices will conclusively distinguish them.

It is scarcely possible to divide our species of *Leiopus* generically upon the presence or absence of fasciculate tufts on the elytra, and, as there is but little difference in the degree of separation of the middle coxæ, the mesosternum being rather broad throughout, it seems probable that all of our species will have to be assigned to *Eleothis* as recently defined by Mr. Bates, or, perhaps more justly, the genus *Sternidius* Lec. should be revived for these species, in which case *Eleothis* would become synonymous.

#### VALENUS n. gen.

Body oblong, depressed, minutely, sparsely pubescent and with long erect sparsely placed flying hairs. Head vertical; front subquadrate, transverse, finely carinate along the coriaceous support of the labrum; mandibles small; palpi slender, unequal, the terminal joints slender and gradually acuminate, second joint of the labial robust, the third oblique and much narrower; mentum small, transverse, very deeply inserted and inwardly oblique; eyes deeply emarginate, moderately finely granulate; antennæ inserted at the sides within the ocular emarginations, widely distant at base, slender, minutely, rather densely pubescent, the first three or four joints with a single series of short, spinose setæ beneath, scape long, slender, cylindrical, without trace of apical cicatrix. Prothorax obliquely spinose at the sides behind. Elytra not carinate at the sides. Anterior coxæ not appreciably angulated externally, the middle cavities distinctly open, narrowly separated. Legs slender; femora feebly clavate; tarsi short, robust, the basal joint of the posterior slightly longer than the next two combined; claws divaricate, small.

This genus belongs near *Lepturges* and is apparently still more closely allied to the Central American *Phrissolaus* Bates, differing from the latter in its much shorter antennæ, depressed form, rounded elytral apices and more normal abdominal structure, the fifth segment of the male being only as long as the two preceding together and obtusely sinuate at apex.

There is an element of uncertainty as to the proper position of Valenus, however, owing to the fact that the only known representative is a male, but if the female proves to have an elongated fifth segment, it can only be compared with *Astynomus*, and from this it departs widely in its spinose and not tuberculate prothorax.

**V. inornatus** n. sp.—Moderately robust, feebly shining, dark rufo-testaceous above, much paler beneath, the color of the integuments not at all concealed by the extremely minute, rather sparse and inconspicuous vestiture, the long flying hairs of the elytra rigid and setiform. *Head* extremely minutely, densely but feebly punctate; antennæ about one-third longer than the body, slender, the scape thicker but not at all clavate, as long as the next two combined, joints three to eleven gradually decreasing in length. *Prothorax* fully one-half wider than long, distinctly wider than the head and two-thirds as wide as the elytra; base and apex transverse, the former distinctly the narrower; sides broadly arcuate anteriorly, obliquely and acutely spinose at basal third, disk very unevenly and sparsely punctate, almost impunctate toward the sides. Scutellum rather large, broadly rounded behind. *Elytra* parallel, the sides straight, three-fourths longer than wide, broadly rounded behind, each elytron narrowly rounded at apex; disk coarsely and rather closely punctate toward base, the punctures becoming sparser and finer toward apex; punctures bearing the flying hairs small and inconspicuous; surface even. Under surface pruinose with dense, extremely minute pubescence. Length 9.0 mm.; width 3.3 mm.

Texas (El Paso). Mr. G. W. Dunn.

Resembles an unusually large robust *Lepturges*, but with much less conspicuous pubescence than in the species of that genus, and without trace of any kind of maculation.

#### HYPERPLATYS Hald.

Our species of this genus are closely allied among themselves, but may possibly be recognized by the following table:—

Body black throughout; antennæ black; femora red, black toward apex.

**femoralis** Hald.

Body paler, clothed above with cinereous pubescence, maculate with small black spots; antennæ in great part pale.

Prothorax but feebly transverse, one-half wider than long; femora red, the apices black.....**nigrella** Hald.

Prothorax strongly transverse, at least three-fourths wider than long.

Elytral spots large and more or less unevenly arranged; elytra unusually coarsely punctate; antennæ of the male about twice as long as the body.....**maculata** Hald.



Elytral spots small, more or less distinctly arranged along three even lines on each elytron, the lines more or less pale; antennæ of the male much more than twice as long as the body.

Elytra coarsely punctate, the punctures distinct.....**aspersa** Say.

Elytra finely punctate, the punctures almost completely concealed by the vestiture; elytral lines very indistinct. Body moderately robust, pale rufo-testaceous throughout, the pubescence short, very dense, pale cinereous-white, the elytral spots small, sometimes with a larger more irregular discal blotch at apical third, the pronotum with four spots in an arcuate line, the two median larger. Head and antennæ nearly as in *aspersa*. Prothorax acutely, obliquely spiculate at the sides at basal fourth or fifth. Elytra twice as long as wide, in form throughout nearly as in *maculata*. Legs pale testaceous throughout, the tarsi alone darker. Length 4.7-6.5 mm.; width 1.8-2.4 mm. (California, Sta. Cruz Co.).....**californica** n. sp.

The species above identified as *nigrella* seems to be abundantly distinct from *maculata* in its much longer male antennæ, and from *aspersa* in its more elongate prothorax and more finely and sparsely punctate elytra, the sides of the latter being much more convergent from base to apex in the male, and with more prominent and less rounded humeri. In *aspersa* the three discal vittæ of the elytra are nearly always very distinct and generally conspicuous, and by this characteristic it can be separated at once from the other species.

Anisopodus White is possibly synonymous with *Hyperplatys*, at least the elongation of the posterior legs appears to be so gradual as to cause great confusion in attempting to limit the former genus.

### SPALACOPSIS Newm.

The species of this remarkable genus which have been discovered within our faunal limits, may be distinguished as follows:—

Scutellum small, not longer than wide, rounded or feebly bilobed behind; elytra parallel.....**stolata**

Scutellum triangular, not longer than wide.

Elytra subparallel, with even rows of coarse and distinct punctures, without denuded spots; scutellum wider than long; size small.....**suffusa**

Elytra inflated behind, with the punctuation close and almost confused, and with large uneven semi-denuded spots; scutellum small, equilateral-triangular; size larger.....**texana**

**S. texana** n. sp.—Slender, cylindrical, distinctly inflated behind the middle of the elytra, densely clothed throughout with rather long recumbent luteo-cinereous pubescence, and with extremely short erect sparse setæ. Head

two-thirds longer than wide, nearly as in *suffusa*, the antennæ a little shorter than the body, the scape one-half longer than the prothorax. *Prothorax* two-fifths longer than wide, equal in length to the head, cylindrical, the sides parallel; surface densely and evenly pubescent, with a small narrow denuded median area. *Elytra* between four and five times as long as the prothorax, equal in width to the latter toward base but two-thirds wider behind the middle, then narrowed to the apex which is deeply, triangularly emarginate, the processes acute but blunt at apex and feebly everted; disk coarsely, deeply, rather closely punctate, the punctures and pubescence having a vaguely lineate disposition, with large uneven semi-denuded blotches. Length 9.7 mm.; width 1.3 mm.

Texas.

Differs greatly from the Mexican *protensa* and *variegata* in its small equilateral scutellum, and from *suffusa* and *phantasma* in its larger size and from the latter in addition in the absence of long curved rigid setæ. From the eastern *stolata* and Cuban *grandis* it differs in its convex and not flattened elytral disk, and from the Cuban *flum* in its non-sulcate elytra. The semi-denuded blotches of the elytra are sparsely scattered, but slightly darker in color, and are broad and very irregular and not linear as in *stolata*.

## TENEBRIONIDÆ.

### STIBIA Horn.

The following species belongs near *ovipennis*, but differs greatly in the structure of the eyes:—

**S. maritima** n. sp.—Moderately robust, strongly convex, polished, brownish-testaceous in color, glabrous. *Head* finely, rather densely punctate and finely, longitudinally subrugulose; antennæ two-fifths as long as the body, very slender, feebly clavate at apex, third joint one-half longer than the fourth, the latter equal in length to the second; eyes moderate, feebly and evenly convex. *Prothorax* two-thirds wider than long, the base and apex equal, the former feebly arcuate, the latter correspondingly emarginate; sides parallel, evenly and distinctly arcuate; apical angles acute but not produced; disk evenly convex, deeply, moderately coarsely punctate, the punctures tending to coalesce longitudinally toward the sides, sparser toward the middle. *Elytra* one-third longer than wide, oval, in the middle one-half to three-fourths wider than the prothorax; sides strongly arcuate throughout, the humeri not evident; apex acute; disk with approximate rows of fine, rather feeble punctures in basal three-fifths only. *Abdomen* minutely, extremely sparsely punctate, the metasternum very coarsely, rather closely so, the prosternum rather coarsely and very densely. *Legs* slender. Length 3.3–3.7 mm.; width 1.6–1.9 mm.

California (San Diego Co.). Dr. F. E. Blaisdell.

A single pair taken on the sea-beach at Coronado.

In *ovipennis* the color is black, the size larger, the form much more robust, the third antennal joint longer, the eyes smaller and very much more convex and prominent, especially behind, and the elytral punctures larger and stronger.

### EPITRAGUS Latr.

**E. vestitus** n. sp.—Rather broadly oval and convex, polished, with a strong æneous tinge; pubescence moderately dense, subrecumbent, pure white in color and conspicuous, the hairs robust, pointed, rather long, arcuate and more or less matted. *Head* coarsely, rather densely punctate laterally, sparsely so toward the middle, the median lobe large, rounded; supra-orbital ridges obsolete; antennæ piceous, moderate in length. *Prothorax* two-fifths wider than long, the sides moderately narrowed from base to apex, feebly arcuate, the apex broadly emarginate, angles right, narrowly rounded and not at all prominent; base broadly, strongly bisinuate; disk evenly convex, feebly bi-impressed at base, rather coarsely, moderately densely punctured laterally, the punctures becoming finer and sparser toward the middle, with a narrow impunctate median line. *Elytra* two-thirds longer than wide, in the middle one-third wider than the prothorax, at the broadly rounded humeri slightly wider than the thoracic base; sides feebly arcuate, oblique behind, the apex narrowly rounded; disk finely, sparsely punctate, with irregular longitudinal impunctate areas toward the suture, the punctures becoming dense laterally and especially coarse, dense and rugulose near the margins toward apex, the surface longitudinally swollen near the suture toward apex. Under surface finely, rather sparsely punctate and distinctly pubescent. Mesosternum deeply excavated. Length 12.0 mm.; width 5.2 mm.

#### Arizona.

A single specimen from the Levette cabinet, which is probably a male. The type appears to be analogous in general form to the males of those species having the pronotum simple in both sexes, and for the present it may be placed near *pruinus*, being readily distinguishable by its robust form, bright metallic subæneous lustre and long conspicuous white pubescence.

The species of *Epitragus* within our boundaries may be identified as follows:—

Sides of the front angulate and reflexed; prothorax much narrower than the elytra, the humeri broadly exposed ..... **submetallicus**  
Sides of the front not prominent or angulate; median lobe large, rounded.

Pronotum simple in the male, more or less bicarinate in the middle toward apex in the female.

- Thoracic carinæ of the female divergent anteriorly .....**acutus**  
 Thoracic carinæ parallel.  
 Larger species ; punctuation dense .....**canaliculatus**  
 Smaller and less robust, the punctuation fine and sparse ; lustre strongly  
 æneous .....**arundinis**  
 Pronotum similar in the sexes and unmodified.  
 Elytra dentate at apex ; pubescence uneven in distribution ...**dentiger**  
 Elytra unmodified at apex, the pubescence even in distribution.  
 Apical angles of the prothorax very acute and anteriorly prominent.  
**fusiformis**  
 Apical angles right or obtuse, not anteriorly prominent.  
 Elytra rugulose ; prothorax rather strongly transverse.  
**plumbeus**  
 Elytra smooth, not at all rugulose, except occasionally toward the  
 sides.  
 Elytra very densely punctate throughout ; prothorax but very  
 slightly wider than long .....**ovalis**  
 Elytra sparsely punctate, at least toward the suture.  
 Elytra nearly glabrous, each puncture with an extremely minute  
 seta .....**pruinus**  
 Elytra conspicuously pubescent, the pubescence white.  
**vestitus**

Although by the characters given, *ovalis* is brought very near to *plumbeus*, it is really quite distinct in general appearance from this and all the other species, being unusually short, oval and convex.

The material before me seems to indicate several closely allied species in the neighborhood of *canaliculatus*, one male, especially, has the punctuation very sparse throughout, with the apical angles of the prothorax not at all everted.

### **EPITRAGODES** Cas.

This name was proposed (Ann. N. Y. Acad., V, p. 365) for the species known as *Epitragus tomentosus* Lec., the principal characters distinguishing it from *Epitragus* being the unexcavated mesosternum and the more or less seriate arrangement of the elytral punctures. I have recently received another species, the two being easily known by the following characters :—

Body rather densely pubescent, the pubescence unevenly marmorate.

**tomentosus**

Body glabrous, each puncture bearing an infinitesimal seta entirely concealed within it .....**jülichii**



**E. jülichii** n. sp.—Almost evenly elliptical, convex, black throughout with slight greenish-metallic lustre. *Head* rather coarsely, densely punctate throughout, the punctures becoming but slightly sparser toward the middle of the vertex; front trilobed, the median lobe longest, broadly rounded; supra-orbital ridge obsolete but slightly evident in front of the upper margin; antennæ about as long as the prothorax, joints six to nine serrate internally. *Prothorax* one-third wider than long, the apex subtruncate, scarcely more than three-fifths as wide as the base, the latter broadly, strongly lobed in the middle, feebly sinuate thence to the basal angles, which are right; apical angles obtuse but not at all rounded; sides broadly arcuate and subparallel in basal half, becoming more arcuate and convergent thence to the apex; disk not at all impressed, rather coarsely, very densely punctate, the punctures nearly in contact but distinct throughout in contour, becoming slightly sparser toward the middle, without an impunctate median line. *Elytra* at base but slightly wider than the prothorax, in the middle one-third wider, three-fourths longer than wide; sides arcuate, acutely ogival at apex; disk with almost even series of rather coarse approximate punctures, the series not at all impressed, the intervals unevenly, uniseriately or biseriately punctate. Under surface rather strongly punctate; mesosternum almost vertical anteriorly and completely unimpressed. *Legs* slender. Length 9.0 mm.; width 4.0 mm.

Texas.

The hind wings are as long as the elytra. Two specimens, probably from the neighborhood of Galveston, one of which I owe to the kindness of my friend Mr. Wilhelm Jülich.

### **ANEPSIUS** Lec.

The two species known to me may be separated as follows:—

Antennæ much longer than the head; elytral punctures arranged in regular approximate series throughout.....	<b>delicatus</b>
Antennæ very short, not longer than the head; elytral punctures arranged serially only towards the sides .....	<b>montanus</b>

**A. montanus** n. sp.—Robust, parallel, convex, polished, black throughout, the legs and antennæ dark rufo-testaceous; integuments glabrous, each puncture bearing an extremely minute seta. *Head* feebly convex, transverse, not very coarsely but strongly and rather densely punctate, the punctures rough or subgranulose; eyes completely divided; antennæ moderately robust and compressed, compact, the last joint not as long as wide and slightly narrower than the tenth. *Prothorax* three-fourths wider than long, the base and apex subequal, the former feebly arcuate, the latter very feebly, broadly sinuate; apical angles right, narrowly rounded; basal obtuse, not rounded and minutely, feebly prominent; sides evenly, rather strongly arcuate; disk evenly convex, rather closely, strongly but not very coarsely punctate laterally, the punctures becoming fine and very sparse toward the middle. *Elytra*

two-fifths longer than wide, scarcely wider than the prothorax, very broadly and obtusely ogival at apex; sides parallel and very feebly arcuate; humeri slightly obtuse, not at all rounded; disk not very coarsely but strongly and conspicuously punctate, the punctures sparse and without distinct serial arrangement except on the vertical flanks, where the series are distinct, the punctures approximate. Epipleuræ narrow. Abdomen finely, sparsely punctate. Legs short. Length 3.2 mm.; width 1.4 mm.

Colorado Mr. W. Jülich.

This species differs from *delicatus* in its shorter, broader form, coarser punctures and radically different punctuation of the elytra. Several specimens.

### **EUSATTUS** Lec.

The following form is not at all closely allied to any other thus far described, but may be placed just after *robustus* in our lists:—

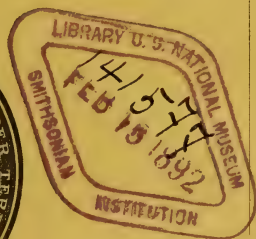
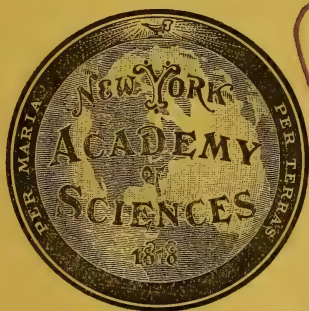
**E. websteri** n. sp.—Form and size nearly corresponding with the larger specimens of *reticulatus*, black throughout, rather strongly convex, glabrous, the pronotum dull and coarsely sericeous, the elytra somewhat shining. Head coarsely, densely punctate, the punctures strongly coalescent and rugulose behind; antennæ subequal in length to the prothorax, the third joint equal in length to the next two together. Prothorax nearly two and one-half times as wide as the median length, the apex deeply emarginate, two-fifths as wide as the base, the latter transverse, broadly sinuate toward the basal angles, which are acute and slightly prominent posteriorly; sides strongly convergent anteriorly and very feebly arcuate from basal third, thence to the base nearly parallel and more arcuate; apical angles anteriorly produced far beyond the eyes, but with the apex rounded; disk strongly convex, very broadly explanate and reflexed at the sides, coarsely, deeply, extremely densely punctate throughout, the punctures longitudinally confluent, and, on the reflexed lateral parts, becoming coarsely rugulose and confusedly confluent. Scutellum distinct, triangular. Elytra twice as long as the prothorax, and, at base, equal to the latter in width, in the middle very slightly wider, scarcely as long as wide; apex very broadly parabolic; sides feebly arcuate; disk convex, almost perpendicular toward the sides and apex; side margins throughout strongly and unusually widely reflexed, each elytron with three strong acutely elevated costæ, which are more or less interrupted, and which do not attain the apical angles, the suture not appreciably costate; intervals coarsely, sparsely and confusedly punctate, evenly concave, each with a single median row of subelongate distant tubercles. Epipleuræ very broad, occupying the entire inflexed sides, strongly impressed near the sides especially toward base; prosternum granulato-punctate, strongly impressed laterally throughout the length, the hypomera strongly, broadly and abruptly oblique downwards. Legs moderate; anterior tibiæ strongly bent at apex and with a very large oblique terminal spur; hind tarsi nearly two-thirds as long as the tibiæ. Length 15.0 mm.; width 10.3 mm.

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## Colorado.

The under surface is clothed very sparsely with short yellowish hairs. One specimen.

I take pleasure in dedicating this species, perhaps the most interesting of the novelties contained in the Levette cabinet, to Mr. F. M. Webster, in partial recognition of many favors rendered by him in connection with the transfer of the cabinet mentioned.

**ELEODES** Esch.

The following species, represented by a series of eleven specimens from the Levette cabinet, is not closely allied to any other, but may be placed for the present near *humeralis*:—

**E. rileyi** n. sp.—Rather robust and convex, somewhat strongly shining, intense black throughout. *Head* coarsely, rather closely punctate; antennæ subequal in length to the head and prothorax, the third joint three times as long as wide and rather longer than the next two combined, the outer joints but moderately robust. *Prothorax* from one-fourth to three-fifths wider than long, the apex broadly, feebly emarginate, distinctly narrower than the base, the latter transverse, generally very broadly, feebly sinuate toward the middle; apical angles obtuse but not at all rounded, basal slightly obtuse, not much rounded and rather prominent; sides strongly arcuate at apical third, thence strongly convergent and nearly straight to the apex, distinctly sinuate before the base; disk rather coarsely, deeply punctate, densely so toward the sides, sparsely and unevenly, with large impunctate patches toward the middle. *Elytra* two and one-half times longer than the prothorax, and, in the middle, from one-fifth to nearly one-half wider than the latter; sides evenly arcuate; humeri narrowly rounded, slightly prominent and usually distinctly exposed; apex narrowly rounded; disk almost vertical behind, rather coarsely, feebly and subasperately punctate, sometimes with very feebly impressed distant lines, the punctures rather sparse, not much denser laterally, confusedly disposed but often having a feeble lineal arrangement. *Prosternum* not at all produced. *Anterior tibial spurs* extremely unequal, the anterior robust, long, subparallel and truncate at apex, the posterior very small, acute, the larger spur still more pronounced, broader and more truncate in the female. Length 12.0–15.0 mm.; width 5.2–7.2 mm.

## Arizona.

The anterior femora are completely unarmed in both sexes, and the relative proportion in the length of the anterior tibial spurs is nearly independent of sex, but both spurs are longer, and the anterior much wider, more broadly truncate and more parallel in the female than in the male.

From *humeralis* the present species differs in its smaller size,

much sparser punctuation, narrower, more convex form and much shorter third antennal joint.

I have dedicated it to Prof. C. V. Riley of Washington, as a slight token of my appreciation of his many acts of kindness and liberality.

**E. nitidus** n. sp.—Rather slender, convex and subcylindrical, black throughout and strongly shining, glabrous. *Head* rather sparsely punctate, moderately coarsely so toward apex; antennæ robust, nearly as long as the head and prothorax, the third joint four times as long as wide and fully as long as the next two together, last three joints distinctly dilated forming a club, the ninth and tenth strongly transverse. *Prothorax* quadrate, very nearly as long as wide, the apex transverse, broadly and feebly bisinuate, equal in width to the base, which is broadly, rather strongly arcuate; apical angles right, narrowly rounded, basal broadly obtuse and not prominent but not at all rounded; sides parallel, very feebly arcuate; disk just visibly wider at apical third than at base, evenly convex, extremely minutely and sparsely punctate. *Elytra* two and three-fourths times as long as the prothorax, and, in the middle, nearly one-half wider, about twice as long as wide; sides broadly arcuate; base broadly emarginate; humeri right, not noticeably exposed; apex acutely rounded; disk obliquely declivous behind, having feebly marked, distant, completely unimpressed series of extremely minute punctures; intervals minutely, sparsely and more or less confusedly punctate, the punctures not distinctly larger or denser laterally. Femora all slender and completely unarmed; spurs of the anterior tibiæ very unequal, the anterior slender, acutely pointed and moderate in size; posterior tarsi slightly compressed, nearly three-fourths as long as the tibiæ. Prosternum slightly prolonged but not at all reflexed, the apex vertical. Length 18.0 mm.; width 6.7 mm.

#### Arizona.

This species, which is represented before me by a single specimen, apparently a male, belongs near *longicollis*, but differs in its flatter, rather shorter prothorax, less rounded on the sides, in its shorter, broader elytra, broadly and rather strongly emarginate at base and having widely distant rows of punctures, and in its shorter, stouter and much more clavate antennæ.

**E. compositus** n. sp.—Moderately robust, convex, intense black throughout, the pronotum dull and strongly alutaceous; elytra shining, very feebly alutaceous, glabrous. *Head* densely dull, finely, rather sparsely punctate; antennæ rather long and stout, fully as long as the head and prothorax, third joint between three and four times as long as wide, outer joints slightly broader, the ninth and tenth somewhat transversely oval. *Prothorax* about as long as wide, the apex and base equal in width, the former broadly, very feebly emarginate, the latter correspondingly arcuate; apical angles right,

slightly blunt, not prominent, the basal broadly obtuse; sides parallel, broadly arcuate or subangulate just before the middle, very feebly sinuate just behind the apical angles, feebly convergent and nearly straight to the base; disk evenly convex, very minutely, sparsely punctate. *Elytra* about two and two-thirds times as long as the prothorax, and, in the middle, one-half wider than the latter, about twice as long as wide; sides broadly arcuate; humeri not at all exposed; apex acutely angulate; disk strongly declivous behind, deeply sulcate, the ridges strongly convex and shining, each with a single rather uneven series of small, moderately distant punctures, the intervals as wide as the ridges, deep, opaque, each with a single series of rather small, close-set, asperate punctures. *Legs* slender, the femora shining, rather finely but strongly punctate, the anterior alone with a strong acute tooth near the apex; tibiae strongly rugose except toward base, the spurs of the anterior small, acute and nearly equal. Prosternum with the apex slightly reflexed, acute and tuberculiform. Length 16.0 mm.; width 6.6 mm.

#### Texas.

A single specimen from the Levette cabinet. This species has but little affinity with any other thus far described, the prothorax being nearly similar to that of *gentilis* and the elytra deeply sulcate, as in the typical *hispidabris*; for the present it may be placed just after the latter in our lists.

### EULABIS Esch.

The species of this genus may be distinguished as follows:—

Pronotum bicarinate; body glabrous ..... **bicarinata**  
 Pronotum not at all carinate.

*Elytra* finely but strongly costate; eyes very short and transverse, occasionally almost divided.

Body sparsely pubescent ..... **pubescens**  
 Body glabrous.

Prothorax much narrower than the elytra, coarsely, deeply punctate, the punctures not at all longitudinally confluent..... **grossa**

Prothorax subequal in width to the elytra, generally more finely punctate and longitudinally rugulose.

Antennæ with the second joint much smaller than any other.

Antennæ long and extremely robust, the tenth joint twice as wide as long; punctures of the elytral series very coarse.

#### **laticornis**

Antennæ shorter, moderately stout, the tenth joint less than twice as wide as long; elytral punctures fine..... **crassicornis**

Antennæ with the second joint subequal to the fifth; smaller species.

#### **rufipes**

*Elytra* not distinctly costate, having series of lineate punctures; eyes much longer and less deeply emarginate..... **obscura**

The last of these was placed in a separate genus by LeConte, and possibly *Epantius* should be regarded as valid, or at least a good subgenus.

**E. laticornis** n. sp.—Moderately robust, subparallel, somewhat depressed, glabrous, black to piceous-black; legs paler, rufo-piceous; antennæ black; integuments dull. *Head* coarsely, densely punctate, the punctures finer, less crowded and more asperate anteriorly; epistoma transversely truncate; eyes short and transverse but only one-half divided; antennæ unusually long, almost attaining the base of the prothorax, extremely stout, the outer joints strongly transverse and compressed. *Prothorax* one-fifth to one-fourth wider than long, the apex transversely truncate, rather distinctly wider than the base, the latter extremely feebly arcuate; apical angles very obtuse, distinctly rounded, basal widely obtuse but not rounded and generally minutely prominent; sides broadly, evenly arcuate, more convergent and straighter toward base; disk widest before the middle, evenly, very feebly convex, coarsely, deeply, extremely densely punctate, the punctures having much less tendency to longitudinal coalescence than in *crassicornis*. *Elytra* one-half longer than wide, oblong-oval, about twice as long as the prothorax, and, in the middle, about one-fourth wider than the latter, abruptly, obtusely rounded at apex; sides broadly arcuate; humeri narrowly rounded, somewhat tuberculiform and prominent and distinctly exposed; base broadly, feebly emarginate, the basal margin unevenly tumid; disk broadly flat above, the costæ strongly marked; intervals each with a single row of coarse deep circular punctures. *Abdomen* densely, coarsely and deeply punctate, each puncture bearing a distinct recumbent hair; median portions broadly impressed or flattened. *Legs* very stout and moderately long, the hind femora much longer than the intermediate; anterior tibiæ slightly arcuate, stout. Length 9.2–10.0 mm.; width 3.8–4.2 mm.

California (San Diego).

One of the two specimens before me formed part of the Levette cabinet, the other was kindly communicated by my friend Dr. F. E. Blaisdell, and was collected at Poway.

This species is quite distinct from any other thus far known; it is nearly as large as *grossa*, but has less inflated elytra. It may be readily distinguished from *crassicornis* by its more robust and especially much longer antennæ, much larger size, more depressed form, coarser punctuation and scarcely at all longitudinally rugulose sculpture of the pronotum.

#### **CIBDELIS** Mann.

**C. lævigata** n. sp.—Moderately robust and convex, intense black throughout, glabrous. *Head* rather coarsely, densely punctate behind, much



more finely so on the epistoma; sides broadly reflexed before the eyes; antennæ rather short and slender, about as long as the prothorax, rufescent at base, the third joint distinctly shorter than the next two together. *Prothorax* nearly twice as wide as the head, two-fifths wider than long, the apex and base subequal, the former truncate, feebly sinuate laterally, the latter broadly, feebly arcuate; sides broadly, evenly arcuate, becoming oblique and straight near the basal angles, which are very obtuse but not rounded; apical angles slightly obtuse and narrowly rounded; disk feebly alutaceous in lustre, evenly convex, rather finely, sparsely punctate throughout, the punctures becoming almost obliterated near the thick marginal bead. Scutellum broad, triangular. *Elytra* two-thirds longer than wide, two and one-half times as long as the prothorax, and in the middle, one-fourth wider than the latter; sides nearly straight and parallel from the strongly oblique and broadly arcuate humeri to posterior third, the apex rather acutely triangular; disk rather strongly, gradually declivous behind, with scarcely at all impressed, distant striæ of small, unevenly spaced and feeble punctures, the intervals shining, coarsely wrinkled, extremely minutely and sparsely punctate, without small tubercles except near the sides toward apex. *Legs* short and slender. Length 13.0 mm.; width 5.6 mm.

California (Sta. Barbara). Mr. G. W. Dunn.

This species differs from *blaschkei* in its shorter, broader form, smooth surface, finely, rather sparsely punctate prothorax with the sides behind oblique and straight and not at all sinuate before the broadly obtuse basal angles, and in the much smoother and less tuberculate elytra. In general appearance it is altogether distinct from either *blaschkei* or *bachèi*. A single specimen.

#### ALÆPHUS Horn.

**A. macilentus** n. sp.—Elongate-oval, moderately convex, pale luteo-flavate throughout, strongly shining, the head and pronotum very slightly alutaceous; body nearly glabrous, each puncture of the elytra bearing a short pale recumbent seta. *Head* rather coarsely punctate, the punctures shallow, strongly and polygonally crowded forming a reticulation of raised lines; eyes large, angulate antero-internally; front deeply impressed at each side in front of the eyes; antennæ slender, cylindrical, filiform, a little longer than the head and prothorax, the outer joints not thicker but gradually much shorter, third very long and slender, though scarcely as long as the next two together. *Prothorax* but very slightly wider than long, the apex transversely truncate, nearly three-fourths as wide as the base, the latter transverse, very broadly, feebly bisinuate; basal angles right, not rounded, the apical very obtuse and rather blunt; sides broadly, feebly, almost evenly arcuate; disk scarcely as wide at base as just behind the middle, feebly convex, broadly, feebly impressed along the middle, feebly, rather widely reflexo-explanate laterally, especially toward base, very feebly, subcoalescently punctate and

minutely subrugulose. Scutellum distinct, broadly rounded or subangulate behind and constricted at the sides near the base. *Elytra* about three times as long as the prothorax, and, in the middle, about one-third wider than the latter, a little more than twice as long as wide; sides broadly arcuate; apex gradually, acutely ogival; humeri broadly rounded, a little broader than the base of the prothorax; disk evenly convex, finely but rather strongly, evenly but irregularly, moderately densely punctate. *Abdomen* finely, sparsely punctate. *Legs* moderate in length, slender. Length 5.0–6.4 mm.; width 1.7–2.2 mm.

Arizona; New Mexico.

Distinguishable from *pallidus* by its much smaller size and more slender form, more quadrate prothorax, still paler coloration and more shining surface lustre. Apparently not rare.

#### IDIOBATES n. gen.

This name is proposed for *Tenebrio castaneus* Knoch, an anomalous form hitherto associated with the normal members of *Tenebrio*, but manifestly distinct by reason of its completely divided eyes and abdominal structure, only the penultimate segment of the latter being provided with a visible coriaceous hind margin. I would suggest that it be placed in the *Blapstini* near *Mecysmus*.

The generic value of *castaneus* was long ago recognized by Bates, and later by LeConte, but I am not aware that it has ever been given a distinctive name. It certainly constitutes as good a connective bond, between the *Blapstini* by way of *Mecysmus* and the other *Tenebrionini* through *Tenebrio*, as could well be found, the undilated anterior tarsi being a matter of no material importance in this connection.

In the table of the tribe *Tenebrionini* given on page 393, Vol. V of these *Annals*, the genus *Calcar*, together with one or two other exotic genera, must constitute a group distinct from the *Tenebriones* by reason of the very exceptional abdominal structure, the coriaceous hind margins of both the third and fourth segments being completely invisible. This well-known fact was inadvertently overlooked in compiling the table alluded to.

#### BLAPSTINUS Latr.

I have recently, by way of experiment, dissected a series of eight specimens of a form very near *rufipes*, probably a variety or race of that species, and have found a singular and altogether unexpected

constancy in the form and size of the rudimentary hind wing, the extreme variation not amounting to more than one-fifth of the average length, the latter being a little more than one-half the total length of the elytra. This is not put forward as proof of any general rule, but simply as an isolated fact in a field very little explored and still less understood.

It seems extremely difficult to account for this constancy by the theory of natural selection, and, as it is impossible to doubt the ever-acting reality of the principle in question, we can only infer that rudimentary organs are not necessarily inordinately variable, and, when comparatively constant, that the standard is maintained by the action of other laws less easily appreciated.

Darwin, in his "Natural Selection," dwells but briefly upon this question, but gives as one instance of variability in rudimentary organs, the wings of a certain beetle which may be either fully developed or more or less rudimentary. Other authors have also cited examples of a corresponding nature. I think, however, that there is more or less doubt to be attached to this entire category of observations, due to a lack of knowledge of the physical conditions under which the various specimens may have existed. It would for example be manifestly repugnant to the fundamental idea of natural selection to imagine individuals of the same species, with fully developed and rudimentary wings living together on the same bush—except in cases of sexual dimorphism, which constitute a wholly different branch of the subject,—for this very principle would tend to eliminate those individuals which were least able to maintain themselves, and we cannot assume that perfectly and partially developed wings constitute conditions equally fitting the species to maintain itself against a great variety of external influences.

The only conceivable circumstances under which individuals of a wingless species may, under the same conditions, also be found with more or less developed wings, are due to occasional reversion to the conditions characterizing the primitive stock from which the species may have been derived. If the species has been differentiated for a comparatively great length of time, which may perhaps be judged of approximately by its degree of departure from related winged species, this reversion will surely be quite exceptional.

Wingless species occurring on oceanic islands are frequently said to be identical with continental fully winged forms, but it seems as

though the mere fact that one form is winged and the other wingless ought to be sufficient ground for specific isolation, especially as it is highly probable that the more or less extended time necessary to bring the winged continental form to the wingless insular condition, will generally be sufficient to develop other specific differences. At all events the wingless island form must always be considered an incipient species or variety, for this kind of isolation has been one of the most potent factors in the differentiation of species as we now understand them.

### CONIBIOSOMA Cas.

The following species bears but little external resemblance to *elongata*, but as the prothorax is strongly fimbriate, the body apparently apterous, and the anterior tibiæ slender, it must either be placed here or in a new genus:—

**C. laciniata** n. sp.—Moderately slender, oblong-suboval, densely punctate anteriorly but rather shining; body black throughout, the legs rufous, the antennæ dark piceo-rufous; pubescence rather dense, moderately long, nearly as in *Blapstinus*, very coarse, rigid, semi-erect and black, not very conspicuous. *Head* short and broad, broadly, feebly sinuate at apex, rather coarsely, very densely and deeply punctate; eyes moderately large, the upper lobe elliptical; antennæ long, about as long as the head and prothorax, stout, clothed throughout with long stiff black setæ, the outer joints gradually, feebly incrassate and distinctly transverse, the eleventh narrower than the tenth, the third long, equalling the next two combined. *Prothorax* about one-third wider than long, the apex as wide as the base, transversely truncate, the base broadly arcuate, not appreciably sinuate toward the basal angles which are obtuse but not rounded; apical slightly obtuse, not rounded; sides broadly, almost evenly arcuate; disk widest near the middle, evenly convex, rather coarsely, very deeply and extremely densely punctate throughout, the side margins with a dense fringe of long erect stiff setæ. *Scutellum* triangular, entering the disk of the elytra, densely punctate. *Elytra* about two and one-half times as long as the prothorax, and, in the middle, nearly one-fourth wider than the latter, fully three-fourths longer than wide, obtusely parabolic at apex; sides parallel, very feebly arcuate; humeri slightly exposed at base; disk with rather coarse, feebly impressed series of somewhat coarse, deep, moderately close-set punctures, the intervals feebly convex, shining, extremely minutely, rather sparsely and confusedly punctate. *Abdomen* rather finely, but deeply and densely punctate, broadly, deeply impressed in the middle in the male. *Legs* rather slender, the hind tarsi with the basal joint subequal to the next two and very much shorter than the last. Length 4.6–5.0 mm.; width 1.8–2.1 mm.



Arizona (Tucson). Mr. H. F. Wickham.

This exceedingly interesting and aberrant species is easily recognizable by its rather long antennæ, conspicuous pronotal fringe and coarse black vestiture; it will probably have to be ultimately separated from *elongata* as a distinct genus.

**PALEMBUS** n. gen.

I have applied this name to a small species, having very nearly the antennal structure of *Oplocephala* Lap. (= *Evoplus* Lec.), and apparently allied to that genus, but differing in its narrower, more depressed form, non-tuberculate head, large coarsely faceted eyes, longer hind tarsi and entire epipleuræ; its general characters are as follows:—

Body parallel, rather strongly convex. Head rather short and broad, the eyes large, more prominent than the sides before them; antennæ short, the last seven joints short and transverse, forming a long loose parallel club; maxillary palpi rather slender, the last joint elongate-oval, about as long as the preceding two together, the apex obliquely and narrowly truncate; mentum obtrapezoidal; ligula large, corneous, the connate paraglossæ large, broadly rounded. Prothorax transverse, the prosternum moderately wide between the coxæ. Elytra striate; epipleuræ narrow, entire, flat. Legs rather slender, the anterior tibiæ not dilated; posterior tarsi long, but slightly shorter than the tibiæ, the basal joint equal to the last and as long as the second and third together, the third one-half longer than wide.

In the type specimen the structure of the middle coxal cavities cannot be clearly discerned.

**P. ocularis** n. sp.—Oblong-elongate, convex, pale rufo-testaceous throughout, shining, glabrous. Head evenly, feebly convex, finely, moderately densely punctate behind, the epistoma rather large, abruptly deplanate, feebly convex and very minutely punctate, the sides strongly convergent, the apex broadly truncate, the surface feebly impressed just before each eye; eyes large, separated above by scarcely their own width; antennæ one-third longer than the head, stout, compressed, the third joint a little longer than the fourth and one-half longer than the second. Prothorax four-fifths wider than long, the apex and base equal, the former broadly, feebly, evenly arcuate, almost truncate, the latter arcuate in the middle, oblique thence to the basal angles which are obtuse and blunt, apical rounded; sides feebly arcuate behind, nearly straight anteriorly; disk slightly widest near basal third, evenly, transversely convex, distantly and feebly biimpressed at base, very finely, not densely punctate. Scutellum slightly wider than long, ogival. Elytra between three and four times as long as the prothorax, equal in width to the latter, fully twice as long as wide, parallel, obtusely rounded behind,

finely striate, the striae feebly but distinctly impressed, finely punctate, the intervals minutely, sparsely and confusedly punctured. *Abdomen* finely, not very densely punctate. Length 3.8 mm.; width 1.3 mm.

Florida.

I owe the above-described specimen to the kindness of Mr. W. Jülich, in whose cabinet there is a considerable series, displaying scarcely any variation.

#### **RUES** n. gen.

This name is proposed for a distinct genus belonging near *Hegemonia* Cast., and represented by the species recently described by me under the name *Helops ovipennis* (Ann. N. Y. Acad., V, p. 487).

It resembles *Hegemonia* in the unusually wide mesosternum, nearly flat between the coxæ, and in the exceedingly short metasternum, but differs in the wider elytra, extremely broad epipleuræ and very short slender legs.

#### **HELOPS** Fab.

Both of the following species are related to *bachei*, and should immediately follow that species in our lists:—

**H. blaisdelli** n. sp.—Oblong-oval, rather strongly convex, piceous-black, the elytra castaneous; antennæ and legs throughout rufo-testaceous; integuments glabrous and strongly shining. *Head* feebly convex, rather coarsely, deeply, moderately densely punctate, the punctures longitudinally coalescent, forming long furrows and rugæ; eyes prominent and convex; antennæ slender, filiform, nearly one-half as long as the body, joints four to ten elongate, evenly obconical, subequal, eleventh a little longer, third much longer. *Prothorax* transverse, one-half wider than long and four-fifths wider than the head; base and apex subequal and both transversely truncate; sides strongly and almost evenly arcuate; apical angles broadly obtuse and narrowly rounded, basal very obtuse but scarcely rounded; marginal bead very fine and feebly developed throughout the length; disk very much wider at basal third than at base, evenly convex, somewhat coarsely, deeply, rather densely and unevenly punctate throughout, the punctures but slightly sparser toward the middle, toward the sides more or less longitudinally coalescent in twos or threes. Scutellum broadly ogival. *Elytra* two and one-half times as long as the prothorax and not in the least wider than the latter in any part, four-fifths longer than wide; sides parallel and nearly straight; apex obtusely ogival; humeri rather broadly exposed at base, slightly obtuse, narrowly rounded; disk rather finely striate, the striae entire, not impressed but abruptly grooved, the punctures elongate, moderate but uneven in size and mutual separation; intervals flat, feebly and confusedly undulated, finely, not

very densely punctate, laterally toward the apex with small, distant, feebly elevated tubercles in single series on each. *Abdomen* finely, somewhat densely punctate; metasternum but slightly shorter than the first ventral segment; mesosternum long and depressed in front, rather narrowly separating the coxæ, feebly declivous and slightly impressed before the coxæ, the process becoming horizontal behind; prosternal process not at all prominent posteriorly. *Legs* moderately long, the tibiæ rather strongly enlarged from base to apex, the anterior tarsi rather broadly dilated in the male, posterior short with the basal joint equal to the next two and much shorter than the last. Length 8.0-9.0 mm.; width 3.2-3.3 mm.

California (San Diego). Dr. F. E. Blaisdell.

The two specimens before me are both males, and have the intro-mittent organ rather broad throughout, abruptly and sharply acuminate at apex, and with the upper surface deeply and longitudinally excavated, the excavation extending almost to the apex; in *bachei* it is finely but less abruptly acuminate, and the upper surface is finely, longitudinally subcarinate near the apex, the excavation being very feeble and much less apical. The form of *blaisdelli* is considerably shorter and the prothorax is very much more transverse.

**H. discipula** n. sp.—Evenly elongate-oval, strongly convex, glabrous, moderately shining, the elytra alutaceous; upper surface dark castaneous, beneath paler, rufescent; legs and antennæ rufous. *Head* coarsely, not densely punctate, the punctures scarcely at all longitudinally confluent, slightly finer anteriorly; eyes prominent; antennæ short, but slightly longer than the head and prothorax, joints four to eight increasing in length, rather slender, obconical, nine to eleven thence gradually shorter and more dilated, the last obliquely oval and not longer than the tenth, third one-half longer than the fourth. *Prothorax* nearly one-half wider than long, the apex rather distinctly narrower than the base, both subtruncate or extremely feebly arcuate; sides strongly evenly arcuate; apical angles broadly obtuse and slightly rounded, basal extremely obtuse and widely rounded; marginal bead very fine but distinct throughout the length; disk not very coarsely, rather densely punctate, the punctures sparser in the middle, with scarcely any tendency to coalesce longitudinally toward the sides. Scutellum broadly triangular, short, coarsely, rather densely punctate. *Elytra* oblong-oval, about three times as long as the prothorax, and, in the middle nearly one-third wider than the latter, twice as long as wide, gradually ogival behind; sides parallel, broadly arcuate; humeri obtuse, exposed at base; disk with very fine, entire unimpressed series of fine unevenly spaced and generally more or less linear punctures, the intervals flat, minutely, sparsely, confusedly punctate, each with a single widely spaced series of very small tubercles, which are rather indistinct toward the suture. *Abdomen* finely, sparsely punctate; sterna nearly as in *blaisdelli*. *Legs* rather long, very slender. Length 7.0 mm.; width 2.9 mm.

California (probably near San Diego). Mr. W. Jülich.

The type is apparently a female, and the anterior tarsi are not dilated. It is easily distinguishable from both *bachei* and *blaisdelli* by the short antennæ and broader elytra, and from the former, in addition, by its short transverse prothorax with fine marginal bead.

**H. cylindriformis** n. sp.—Narrow, strongly convex, subcylindrical, black throughout, shining and feebly alutaceous. *Head* scarcely as long as wide, broadly, evenly, feebly emarginate at apex, the surface rather finely and densely, very strongly punctate; eyes rather more prominent than the feebly reflexed sides before them; antennæ slender about one-half as long as the body (male) or scarcely as long as the head and prothorax (female), third joint a little longer than the next two together, outer joints gradually and only slightly broader, the tenth about one-half longer than wide and a little shorter than the eleventh, the latter slightly longer in the male where it is twice as long as wide, obliquely acute at apex. *Prothorax* elongate, fully as long as wide, the apex broadly arcuate, a little narrower than the base, the latter subtruncate; sides broadly arcuate at or just before the middle, feebly convergent and more feebly arcuate to the apex, broadly, distinctly sinuate before the basal angles which are right, not at all rounded and somewhat prominent; disk evenly convex, finely, densely punctate, the punctures strong and always distinctly separated, but slightly less dense toward the middle where there is usually a narrow uneven impunctate line. *Elytra* twice as long as wide, not quite three times as long as the prothorax, and, in the middle, scarcely two-fifths wider than the latter; sides parallel, broadly, feebly, evenly arcuate; apex obtusely ogival; humeri completely obsolete, the base exactly equal to the thoracic base; disk with unimpressed series of small unevenly spaced but generally approximate and slightly elongate punctures, the intervals flat, very finely, irregularly, sparsely punctate. *Abdomen* very finely, rather sparsely punctate. *Legs* slender, the anterior tarsi very slightly dilated in the male. Length 9.0–14.0 mm.; width 3.2–5.0 mm.

New Mexico (Fort Wingate). Dr. Shufeldt.

This species, which is represented by a series of eight specimens, is allied to *difficilis*, but differs in its more slender subcylindrical form, much more elongate prothorax with less blunt apical angles, narrower and more finely and sparsely punctate elytra and rather shorter antennæ.

*H. viridimicans* Horn appears to be homologous with the Cuban *rufipes*, and to be more appropriately assignable to *Nautes* than to *Helops*, although it must be confessed that the difference between these genera has not been very satisfactorily expressed.

*H. montana* Lec. is quite distinct from *convexula* in its broader, more oblong form, and in its longer and much stouter antennæ and notably larger size.



**STRONGYLUM** Kirby.

Two specimens of *S. atrum* Champ., from the Levette cabinet and labeled "Arizona" are before me. This species is quite aberrant in appearance and may be known at once by its large size, smooth but dull surface, rather coarse, very dense pronotal punctuation and fine unimpressed and feebly punctate elytral striæ.

**CISTELIDÆ.**

There is probably no family, even of the Heteromera, where the differentiation of genera depends so little upon definite and constant modifications of special organs, and so greatly upon general habitus, as in the Cistelidæ. There are, for example, but few special characters relating to the palpi, tarsal lobes, eyes or antennæ, which remain invariable throughout the limits of even those genera which, in the majority of species, are particularly distinguished by important developments or modifications of any one of the organs mentioned. We are therefore beset with numerous difficulties in our definition and limitation of the genera.

In regard to the family considered in its entirety, however, the case is quite different, since there is no group of the Heteromera which is so homogeneous within itself, or so clearly limited in extent. For, while closely related to the Tenebrionidæ through *Strongylium* and other allied genera, it is always and invariably distinguishable by the pectination of the tarsal claws; besides this there is, in the vast majority of genera, a marked and unmistakable peculiarity of facies which can seldom be mistaken.

The porous system of the antennæ is developed to an extent unknown in the Tenebrionidæ, except in certain of the strongyliide genera, the entire surface of all but three or four of the basal joints being studded with large circular sparsely placed pits, which are filled with a white sensitive material of a spongy-pubescent nature. These pores are frequently so large as to be quite conspicuous under the lowest powers of amplification.

The Cistelidæ resemble the lower Tenebrionidæ in the prolongation backward at the sides of the third and fourth ventral segments, which is however more marked and general than in the latter family, and also in the well-developed coriaceous posterior margin of these

segments; also in the thinner integuments of the body, with soft and easily ruptured connective tissues. Perhaps some of the characters which the family in general possesses in common with the Strongyliini, indicate really a higher development than that of the Asidinae and Tentyriinae; the superior powers of perception indicated by the complex porous system of the antennæ, large eyes and more developed palpi, would, at any rate, seemingly point to this conclusion.

As more important distinctive characters of the family, it may be said that the antennæ and tarsi are usually long and slender, the basal joint of the posterior tarsi being more or less elongate. The anterior coxæ are narrowly separated, the cavities always closed behind but never confluent, at least externally, although sometimes separated by a very thin lamina; beneath this lamina they may possibly sometimes be confluent, but usually appear to be separated by a more or less thickened membrane. The eyes are generally large, sometimes extremely so. The mandibles are small or moderate, arcuate and finely notched at apex, occasionally being nearly entire, but this character cannot be advantageously employed in classification, except in distinguishing closely allied genera. The genera with lobed tarsi appear, as a rule, to be more constant in generic as well as specific characters, than those with simple tarsi.

The sexual characters of the male are generally strongly manifested in the eyes, antennæ or genital apparatus. The intromittent organ is more or less acutely pointed at apex, the under side being channeled, except very near the apex. Lying in this groove is a curious straight spike hinged at one end to a point of attachment within the channel, which can be placed in a position perpendicular to the organ, and which probably locks the organ securely to the inner surface of the vagina. The strong hold thus obtained, is often abundantly evident by the great extrusion of the female viscera in specimens captured *in copula*. It is quite singular that this spike is not exhibited in any of the many elaborate and apparently careful drawings of Mr. Saunders published in the *Biologia*; it is often plainly visible, projecting from the under surface of the penis in *Hymenorus*.

The abdomen consists of five segments in both sexes. The œdeagus proper is protected by a plate which is often extruded beyond but usually concealed beneath the fifth segment, the plate

being sometimes quite prominent behind in one or both sexes according to the genus;<sup>1</sup> it is generally deeply bilobed in the male and more or less truncate in the female, but may occasionally be completely non-lobed in the male. Under the latter circumstances it has much the appearance of an additional segment, and is often designated the "sixth segment." It is, however, not a segment in any such meaning as is attached to the other abdominal segments, but is a part of the genital apparatus, and should more properly be termed the "genital armature." It probably serves no other purpose than a guide or protection to the œdeagus proper, the lobes of the male not constituting in any sense a clasping or locking organ.

In view of the intricate affinities of the various genera and the complex, extremely prominent and greatly diversified sexual modifications of the antennæ, palpi, eyes, tarsi, fifth ventral segment and genital armature in the various species composing them, a general and exhaustive study of the Cistelidæ would undoubtedly prove one of the most instructive but, at the same time, one of the most laborious works which could well be undertaken. In the absence of a sufficiently general knowledge of the family, I feel therefore, that the characters employed in the following table will, in many cases at least, be ultimately found to possess far less value than would, with the comparatively limited material at my service, appear to belong to them. However, as represented in our fauna the genera may for the present be distinguished by the following characters:<sup>2</sup>—

<sup>1</sup> The group "Cténipides" of Lacordaire will probably not prove to be entirely natural, and as there are extremely few genera—*Andrimus* (Cteniopis Lec.), and possibly *Androchirus*—within our faunal limits, which can be placed within it, I have disregarded it in the generic scheme which is here presented. A division into distinct groups, based upon the protrusion of the genital armature in both sexes, would give rise to difficulties analogous to those encountered in attempting to divide *Mycetophila* into distinct genera on certain prosternal characters, a statement of which will be given more fully under that genus.

<sup>2</sup> I have been greatly aided in this investigation by material placed in my care by Prof. C. V. Riley and Mr. W. Jülich, and also have to acknowledge my indebtedness to Mr. Champion for typical representatives of many of the Central American forms, which have been extremely useful in many cases besides that of proving the equality of *Prostenus californicus* and *Xystropus fulgidus*.

Intercoxal process of the abdomen rather wide, with the apex more or less evenly and broadly rounded.

Tarsi not lobed beneath.

Antennæ stout, incrassate and compressed, with the subapical joints quadrate or transverse ..... **Xystropus**

Antennæ more filiform, with the subapical joints longer than wide.

**Lystronichus**<sup>1</sup>

Tarsi lobed beneath; body upiform, the antennæ slender... **Stenochidus**

Intercoxal process of the abdomen narrow, acute and angulate.

Tarsi lobed beneath.

Head in repose resting against the prosternum and coxæ, the former strongly declivous anteriorly..... **Lobopoda**

Head in repose free, the prosternum before the coxæ longer and less declivous.

Prothorax more or less rounded at apex, the sides never convergent toward base.

Basal angles of the prothorax right or slightly obtuse, the body generally more or less oblong and parallel..... **Hymenorus**

Basal angles of the prothorax more or less acute and posteriorly prominent; body broader and oval ..... **Menœceus**

Prothorax cordate, truncate at apex, the sides convergent and sinuate toward base, the basal angles rather prominent..... **Telesicles**

Tarsi not lobed beneath.

Third antennal joint generally subequal to the fourth at least in the female, in *Isomira* sometimes slightly shorter in that sex and more frequently so in the male; elytral striæ often obliterated.

Antennæ shorter, generally stout, the joints strongly obconical; form of body oblong, subparallel; punctuation and pubescence generally coarse and sparse..... **Mycetophila**

Antennæ longer, more slender, the joints very feebly obconical or subparallel; form oval, the punctuation and pubescence usually minute and very dense ..... **Isomira**

Third antennal joint always distinctly shorter than the fourth, but longer in the female than in the male.

Anterior tarsi more or less dilated in the male.

Legs short, the tarsi generally distinctly shorter than the tibiæ; body but slightly convex longitudinally.

Mandibles notched at apex, the lobes equal and acute; elytra but feebly dehiscent and only very near the apex, the striæ obliterated laterally; genital armature deeply bilobed in the male.

**Tedinus**

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<sup>1</sup> I feel obliged to employ this particular combination of letters for the generic symbol, since this is given as the original spelling in the *Biologia*. I have, however, not seen the work of Latreille in which it is so printed.



Mandibles obliquely truncate at apex, the truncation feebly, unequally, obtusely bilobed; elytra strongly dehiscent in apical third to half, the punctured series distinct throughout the width; genital armature sinuato-truncate and completely non-lobed in the male ..... **Andrimus**

Legs long and slender, the tarsi as long as the tibiæ; body more longitudinally convex; mandibles deeply notched at apex, the lobes acute and subequal; elytra dehiscent in more than apical third, deeply striato-sulcate throughout the width; genital armature deeply bilobed in the male, the lobes very prominent.

**Capnochroa**

Anterior tarsi not dilated in the male, but usually strongly compressed and distorted; body generally strongly, longitudinally convex.

Mandibles distinctly notched at apex, the apices acute and subequal; antennæ more or less compressed and serrate ..... **Cistela**

Mandibles very oblique and feebly notched at apex, the upper lobe much longer and broader than the lower, acute; antennæ long and filiform ..... **Androchirus**

**XYSTROPUS** Sol.

*Prostenus* Horn nec Latr.

The head in *Xystropus* is almost of the same form as in *Helops* and some other allied genera of *Tenebrionidæ*; in *Stenochidus* it is of a more strictly cistelide type, but still the general form of body recalls the *Tenebrionidæ* much more forcibly than any of the typically cistelide genera which follow. In fact there seems to be some decided coördination between the form of the abdominal process and relationship with the *Tenebrionidæ*. This is my reason therefore for placing *Xystropus* and its allies first instead of last in the series.

In *Xystropus* as represented by *californicus*, the eyes are small, short and strongly transverse, the antennæ moderate in length, stout, incrassate and compressed, the maxillary palpi moderate, with the apex of the fourth joint but moderately oblique and the angle at the base much less than right, resembling somewhat that of *Helops californicus*. The prosternal process is horizontal posteriorly, then abruptly vertical to the level of the prosternal sidepieces, where it becomes strongly dilated, widely separating the latter at the posterior margin; the hind coxæ are distinctly separated by a rounded abdominal projection. The legs are short, the tarsi without lobes, clothed beneath with long coarse hair, and with the basal joint of the posterior unusually short. The ungues are

moderate in length, the outer contour almost evenly arcuate, the apex finely and acutely produced beyond the pectinate portion, the latter extending nearly to the base, the denticles fine, long and spiniform, gradually becoming very short toward base, eight or nine in number.

The single tropical species which extends within our faunal limits may be described as follows:<sup>1</sup>—

**X. californicus** Horn.—Trans. Am. Ent. Soc., 1867, p. 138 (*Prostenus*); *fulgidus* Mäkl.: Act. Soc. Fenn., X, p. 680.—Oblong-oval, evenly, moderately convex, polished throughout, the upper surface metallic red, the under black with steel-blue reflection; legs and antennæ black throughout; integuments devoid of fine pubescence, the upper surface bristling with long erect setæ from the coarse punctures. *Head* coarsely, very sparsely punctured, the eyes small; antennæ one-half as long as the body, very stout, compressed, feebly attenuate through the last three joints, the ninth joint as wide as long, third distinctly longer than the fourth. *Prothorax* transversely oval, but little more than one-third wider than long, the sides feebly angulate at basal third; disk without trace of impression or basal foveæ, extremely coarsely, sparsely and unevenly punctate, the large circular punctures intermingled with smaller ones. *Elytra* between three and four times as long as the prothorax, and, in the middle, about two-fifths wider, acutely parabolic at apex, the sides feebly arcuate, the humeri rather narrowly rounded and broadly exposed, the disk with unimpressed series of rather coarse close-set punctures; the intervals each with a single series of widely distant punctures, which are very much larger than those of the striæ. *Abdomen* finely, sparsely punctured. *Legs* short, slender, the tarsi somewhat compressed, short, the basal joint of the posterior but slightly longer than the next two combined. Length 9.3 mm.; width 3.5 mm.

California; Mexico; Panama; Colombia.

The representative from Panama, sent me by Mr. Champion, is precisely similar in every detail to the single specimen of *Prostenus californicus* in the LeConte cabinet at the Cambridge Museum. This indicates a distribution which certainly could not have been anticipated from analogy, at least in the present family.

#### LYSTRONICHUS Latr.

A comparatively composite genus in its present scope, essentially tropical in distribution, but extending to the extreme southern limits of the United States.

<sup>1</sup> In stating the degree of separation of the eyes in terms of their own width in the descriptions which follow, the point of sight is assumed to be in a perpendicular to the middle point of the interocular surface.

But one species has been described from our fauna, although two are said to be known from Texas.

**L. piliferus** Champ.—Biol. Cent.-Amer., Coleopt., IV, Pt. i, Nov. 1888, p. 462.

I have not seen any representative of this species. It is probable, however, from the remarks made by Mr. Champion, that it will ultimately have to be separated from the more typical forms of the genus.

It is "oblong-ovate, feebly convex, obscure reddish-brown, opaque, above usually of a pruinose bluish-violet, obscure purplish, or greenish-bronzy tint, the surface somewhat thickly clothed with long erect hairs, and also sparsely pubescent." The antennæ are "very long, slender and filiform," and the elytra have "rows of very minute punctures placed upon obsolete striæ." Length 6.0–8.3 mm.; width 2.0–3.5 mm.

#### **STENOCHIDUS** Lec.

In this genus the posterior coxæ are moderately separated by a short abdominal projection, which is evenly rounded at apex and quite similar to that of *Xystropus*, the anterior being separated by a rather wide, longitudinally convex prosternal process, which is strongly declivous and gradually attenuate behind. The legs are long and slender, the penultimate joint of all the tarsi strongly lobed beneath, the antepenultimate joint of the anterior and intermediate also lobed but less strongly, that of the posterior simple; these modifications are independent of sex.

The mandibles are distinctly notched at apex, the two lobes subequal. The fourth joint of the maxillary palpi is elongate, more or less recti-triangular, and differs sexually in form as described below under *S. gracilis*; the last joint of the labial is short and robust, wider than long, with the inner side slightly shorter than the outer. The ungues are moderate in size, the external outline more arcuate near the apex, the latter being finely and acutely produced beyond the pectination, which is long and rather fine, the denticles six or seven in number.

The general form of the body is elongate and convex, the prothorax subcylindrical, the integuments being more or less strongly granulato-reticulate and completely glabrous. The wings are well developed.

*Stenochidus* seems more closely related to *Narses* Champ. than to any of the other Central American genera, but the general aspect of the species must be quite different. Our species are only two in number and may be thus distinguished:—

Very dull, the legs black, with the basal three-fourths of the femora red.

***gracilis***

More shining, the elytral punctuation more distinct; legs black throughout.

***cyanescens***

**S. *gracilis*** Lec.—Ann. Lyc. N. Y., V, 1851, p. 150.—Oblong, subparallel, strongly convex, black, the elytra sometimes with a bluish tinge, the basal three-fourths of the femora red; upper surface throughout very dull and strongly reticulato-granulose. *Head* and pronotum somewhat coarsely, very densely punctate; eyes small; antennæ long and slender, gradually incrassate. *Prothorax* quadrate (male) or very slightly transverse (female), the apex transversely truncate, almost as wide as the base, the latter very feebly bisinuate; basal angles slightly obtuse and quite distinctly blunt; sides nearly parallel and feebly arcuate, slightly more convergent near the apex; disk feebly, cylindrically convex, not impressed; foveæ obsolete. *Elytra* three and one-half times as long as the prothorax and nearly one-half wider, rather abruptly, obtusely ogival in apical third; sides nearly straight, parallel; humeri narrowly rounded and broadly exposed at base; disk with fine, minutely punctate striæ; intervals not distinctly punctate. *Abdomen* more shining, finely, sparsely punctate. *Legs* very long and slender, the hind tarsi much shorter than the tibiæ, with the basal joint distinctly longer than the remainder.

*Male*.—Eyes separated by two-thirds more than their own width; antennæ two-thirds as long as the body, slender, feebly incrassate, the ninth joint fully twice as long as wide; maxillary palpi with the fourth joint rather more than twice as long as wide, the angle at the support distinctly more than right, the apex a little longer than the outer side; abdominal punctures strong, becoming closer toward apex, the fifth segment entire at apex, with the surface broadly feebly impressed along the middle.

*Female*.—Eyes separated by fully twice their width; antennæ one-half as long as the body, gradually, rather strongly incrassate, the ninth joint obconical, one-half longer than wide; fourth palpal joint recti-triangular, twice as long as wide, the apex not at all longer than the outer side; abdomen very minutely, feebly, sparsely and evenly punctate throughout.

Length 7.0–8.0 mm.; width 2.3–2.9 mm.

California (Santa Cruz and San Diego Cos.).

The elytral striæ are more strongly impressed in the female, very feebly so in the male, and the third and fourth antennal joints are equal in both sexes. The male is generally distinctly more slender than the female.



**S. cyanescens** Lec.—Proc. Ac. Phila., 1859, p. 78.—Elongate, the body, legs and antennæ throughout black, rather strongly shining. *Head* rather coarsely, densely punctate. *Prothorax* but slightly wider than long, nearly as in *gracilis* but more finely, not so densely punctate, the punctures all narrowly separated. *Elytra* four times as long as the prothorax in the male, distinctly shorter in the female, one-third wider than the latter, the humeri narrowly rounded and broadly exposed; disk with feebly impressed series of rather coarse impressed punctures, the intervals nearly flat in both sexes and minutely, sparsely punctate, the punctures arranged in single series and more distinct in the male. *Legs* and abdomen in both sexes nearly as in *gracilis*.

*Male*.—Eyes rather large, separated by one-fourth more than their own width; antennæ two-thirds as long as the body, just visibly stouter toward apex, the ninth joint much more than twice as long as wide and nearly parallel.

*Female*.—Eyes separated by nearly twice their width; antennæ one-half as long as the body, feebly incrassate toward apex, the ninth joint very feebly obconical and nearly twice as long as wide.

Length 8.0–9.0 mm.; width 2.3–2.8 mm.

Nevada; California (Siskiyou Co.).

This species greatly resembles *gracilis*, but is more slender and rather less convex, with the legs entirely black, and the punctures of the elytral striæ much larger and more conspicuous. All the specimens before me are deep black, but, as the name indicates, the color may perhaps occasionally be of a bluish tinge.

### LOBOPODA Sol.

*Allecula* Say, Lec.

The species of Lobopoda are, as a rule, above the average of the family in point of size, and are sometimes surprisingly closely allied among themselves. The form is generally more or less oblong-oval and gradually pointed behind, and the punctures of the elytral series are almost invariably finer or more or less linear toward apex, often becoming completely obsolete.

The tarsal lobes are especially highly developed, and generally differ sexually to a marked degree, the lobes of the penultimate joint being, however, usually free from sexual modification. Attempts have been made to subdivide the genus upon the basis of variation in the number and disposition of the lobed joints in the male and female, but, as in most characters of this nature, there are so many intergrading forms, that these efforts have only met with partial success.

These tarsal modifications are useful, however, in tabulating the

species, but as the number of representatives within the limits of the United States is comparatively small, and as the male of several of our species is still unknown to me, I have, in the following preliminary table, simply employed general characters relating to superficial form and sculpture, and based upon the limited material before me.

Our species as far as known may be distinguished as follows:—

Pronotal punctures very sparsely and unevenly distributed, generally more or less densely aggregated along the median line and in front of the scutellum.

Pronotum rather polished, the punctures circular and perforate.....**socia**

Pronotum exceedingly dull and alutaceous, the punctures larger, uneven in size, shallow, elongate and variolate.....**subcuneata**

Pronotal punctures more closely placed and evenly distributed, impressed.

Eyes in the female separated by approximately one-half their width.

Eyes in the male not quite contiguous, their inner margins broadly rounded.....**punctulata**

Eyes in the male subcontiguous along a long fine straight double line.

**oculatifrons**

Eyes in the female separated by distinctly less than one-half their width;

legs usually red throughout .....**erythrocnemis**

Eyes in the female separated by fully their own width.....**atra**

A number of additional species will almost undoubtedly be discovered when southern Texas is more thoroughly and systematically explored.

**L. socia** Lec.—Proc. Ac. Phil., VII, 1854, p. 84.—Elongate-elliptical, castaneous above, the under surface and posterior legs blackish; anterior and intermediate legs and antennæ rufo-castaneous; integuments rather polished throughout, the pubescence coarse, rather short, sparse. *Head* somewhat finely, sparsely, unevenly punctate; eyes large and approximate; antennæ very slender and filiform, nearly one-half as long as the body, the joints cylindrical and nearly four times as long as wide, the third slightly shorter than the fourth. *Prothorax* not quite twice as wide as long, the apex truncate and three-fourths as wide as the base, the latter transverse, the sinuations broad and strong; sides just visibly convergent from the basal angles to anterior third and straight, thence strongly rounded to the apex; basal angles right, not appreciably blunt; disk rather coarsely, very sparsely and unevenly punctate, the punctures larger and closer before the scutellum and narrowly along the median line; basal foveæ large and distinct. *Elytra* four times as long as the prothorax, and, in the middle, about one-fourth wider, gradually acute toward apex, the base very slightly wider than that of the prothorax; sides feebly, broadly arcuate; disk with rather fine, very even, moderately impressed series of somewhat coarse, deep, close-set punctures, the intervals nearly flat, finely, sparsely punctate. *Abdomen* finely but strongly, very

sparsely punctate. *Legs* long and slender; basal joint of the hind tarsi four-fifths as long as the remainder.

*Male*.—Unknown.

*Female*.—Eyes separated by one-fourth of their width; anterior tarsi with the two basal joints simple, the third rudimentarily lobed, the fourth strongly lobed, the intermediate with the three basal joints simple, the fourth strongly lobed, posterior simple, the penultimate joint with a short, narrow, extremely rudimentary lobe.

Length 11.0 mm.; width 4.2 mm. ♀.

Texas (Laredo). Cab. LeConte.

The description is drawn from the female. It is very closely allied to *mexicana* Champ., but differs from the corresponding sex of that species in its slightly closer punctuation on the elytral intervals; there are usually but two punctures in a transverse direction in *mexicana*, while in *socia* there are about three, which are rather smaller than in the former. This is the only decided difference of any kind which it is possible to discover, but I think that the two species are distinct and that this would be clearly evident if the males were compared. The elytra are perfectly simple and narrowly rounded at apex in the female of *socia*. This species is not at all closely related to *punctulata*.

**L. subcuneata** n. sp.—Elongate, moderately convex, the elytra cuneate, black throughout, the head and prothorax smooth but dull and strongly alutaceous, the elytra more shining; pubescence coarse, moderate in length, very sparse. *Head* finely, rather densely, unevenly punctured, the epistoma coarsely, much more sparsely so and more shining; eyes very large; antennæ filiform, fully one-half as long as the body. *Prothorax* three-fifths wider than long, the apex truncate and two-thirds as wide as the base, the latter transverse, with broad and deep sinuations, the angles right, not blunt; sides parallel and straight in basal two-thirds, then broadly, evenly rounded to the apex; disk extremely obsoletely impressed along the middle, coarsely, extremely unevenly punctate, the punctures mingled with smaller ones, dense toward the median line and base, sparse laterally, with two large impunctate discal areas; punctures shallow and variolate, the larger ones elongate-elliptical in form; basal foveæ large and distinct but shallow. *Elytra* four times as long as the prothorax, and, just behind the humeri, very slightly wider; sides feebly convergent and nearly straight from this point nearly to the apex, which is then more abruptly, acutely rounded; disk finely but distinctly striate, the striae very finely, not closely punctate, the intervals nearly flat, finely, extremely sparsely punctate. *Abdomen* in the male finely, not strongly, very sparsely punctate throughout. *Legs* slender, the hind tarsi nearly as long as the tibiae, with the basal joint equal in length to the remainder.

*Male*.—Eyes nearly as in *punctulata*; antennæ with the third joint but

slightly shorter than the fourth; tarsal characters as in *punctulata*, except that the third joint of the intermediate tarsi is feebly lobed.

*Female*.—Unknown.

Length 9.0 mm.; width 3.0 mm. ♂.

Texas.

The unique specimen, which is fortunately a male, represents a remarkably distinct species, not at all closely related to any other here described, and readily known by its cuneate elytra, dull lustre and peculiar pronotal punctuation.

The anterior tibiae of the male are broadly, very obtusely toothed internally at basal two-fifths, this character being common to the males of a large number of species; in *punctulata* and *oculatifrons* it is more nearly in the form of a broad swelling.

**L. punctulata** Melsh.—Proc. Ac. Phil., III, 1846, p. 59.—Elongate-oval, dark castaneous; under surface and legs piceous-black, the tarsi and antennae rufo-ferruginous; surface strongly polished throughout, the pubescence rather fine, somewhat long and sparse. *Head* rather strongly, sparsely punctate; eyes very large; antennae slender, filiform. *Prothorax* one-half to three-fourths wider than long, the sides distinctly convergent and nearly straight from the basal angles nearly to the apex, then strongly rounded for a short distance to the apex, which is truncate and three-fourths as wide as the base, the latter transverse, the sinuations broad and deep; basal angles right, not blunt; disk obsoletely, broadly impressed along the middle, very coarsely, nearly evenly and rather closely punctate, the punctures separated by two to three times their width; basal foveae distinct. *Elytra* four times as long as the prothorax and scarcely perceptibly wider than the base of the latter, gradually acute behind from the middle; sides nearly straight thence to the base; disk rather finely but deeply striate, the punctures moderately coarse and not very approximate; intervals feebly convex, rather finely and not very closely punctured. *Abdomen* somewhat strongly, sparsely punctate, a little more closely so along the middle in the male. *Legs* long, slender, the basal joint of the hind tarsi equal in length to the remainder.

*Male*.—Narrower than the female; eyes broadly rounded throughout internally and subcontiguous through an interval equal to one-half the length of the epistoma; antennae fully one-half as long as the body, with the third joint two-thirds as long as the fourth; anterior tarsi with the four basal joints strongly lobed beneath, the intermediate with the fourth only, the posterior with the penultimate narrowly and rudimentarily lobed.

*Female*.—Eyes separated by fully one-half their own width; antennae two-fifths as long as the body, the third joint but slightly shorter than the fourth; anterior tarsi with the three basal joints perfectly simple, the fourth strongly lobed, intermediate and posterior nearly as in the male.

Length ♂ 9.0, ♀ 9.3–9.7 mm.; width ♂ 3.0, ♀ 3.5–3.7 mm.



Texas; Kansas; New Jersey.

The elytral intervals are slightly more sparsely punctured in the male than in the female. *Punctulata* may be distinguished at once from *socia* by the pronotal punctuation, the punctures being widely dispersed except toward base and narrowly along the middle in the latter, and the size of *socia* is much greater. In *punctulata* the eyes are not absolutely contiguous in the male, but are separated by a narrow setose isthmus; in *oculatifrons* they are contiguous along a fine straight double line which is however also setigerous.

**L. oculatifrons** n. sp.—Elongate-oval, moderately convex, black throughout; anterior tarsi ferruginous; antennæ piceous, gradually paler toward apex; lustre polished throughout, the pubescence rather long, fine, moderately sparse, piceo-fulvous in color and not at all conspicuous. *Head* rather coarsely, sparsely punctate; eyes very large but extremely unequal in the sexes; antennæ long, slender and filiform, one-half as long as the body. *Prothorax* from one-half to two-thirds wider than long, subquadrate, the sides almost parallel and straight in basal two-thirds, then strongly, evenly rounded to the apex, the latter truncate, three-fourths as wide as the base, which is transverse, the sinuations broad and very strong; basal angles right, not blunt; disk coarsely, evenly and somewhat closely punctate throughout, obsolete impressed along the middle; punctures generally separated by two to three times their width; basal foveæ distinct. *Elytra* four times as long as the prothorax and about one-fifth wider, gradually acute behind from about the middle, the sides parallel and nearly straight toward base; humeri very narrowly exposed; disk rather finely but strongly, evenly striate, the striae punctures moderately coarse, deep, perforate and rather approximate; intervals nearly flat, finely punctate, sparsely so in the male, decidedly densely so in the female. *Abdomen* rather finely but strongly, sparsely punctate, not noticeably more densely so along the middle in the male. *Legs* long and slender; basal joint of the posterior tarsi fully equal in length to the remainder.

*Male*.—More slender than the female, the eyes extremely large, contiguous along a fine straight line which is nearly as long as the entire epistoma; antennæ with the third joint two-thirds as long as the fourth; tarsal characters as in *punctulata*.

*Female*.—Eyes separated by slightly more than one-half their width; antennal and tarsal characters as in *punctulata*.

Length ♂ 9.5, ♀ 10.2–10.8 mm.; width ♂ 3.2, ♀ 3.8–4.0 mm.

Texas.

This species, while allied to *punctulata*, may be easily distinguished by its larger size, more parallel and subquadrate prothorax, intense black color, the larger eyes of the male and the decidedly denser elytral punctuation especially of the female. The difference in the density of elytral punctuation of the male and female is extremely pronounced.

**L. erythrocnemis** Germ.—Ins. Spec. Nov., 1824, p. 164.—Oblong-oval, moderately convex, polished, black above and beneath, the legs and antennæ throughout rufous; pubescence coarse, fulvous, moderate in length, sparse. *Head* somewhat strongly, very sparsely, unevenly punctate; eyes large; antennæ slender, about one-half as long as the body, the third joint slightly shorter than the fourth in both sexes. *Prothorax* one-half wider than long, the sides parallel or feebly convergent from the basal angles to anterior third, then strongly rounded to the apex, the latter truncate and fully two-thirds as wide as the base, the sinuations strong; disk extremely obsoletely impressed along the middle, not very coarsely, rather evenly and unusually sparsely punctured, the basal foveæ almost obsolete. *Elytra* but slightly wider than the prothorax and about four times as long, the apex acutely ogival; sides nearly parallel and straight; disk finely but deeply striate, the striae punctures moderate, rather large and perforate toward base, smaller but still distinct to the apex; intervals finely, sparsely punctate. *Abdomen* finely but distinctly, very sparsely punctate. *Legs* slender.

*Male*.—Eyes separated by a narrow isthmus, the inner margins broadly, evenly rounded; tarsal characters as in *punctulata*.

*Female*.—Eyes separated by one-third to nearly two-fifths their width.

Length 8.5–9.5 mm.; width 2.9–3.6 mm. ♂ ♀.

Louisiana.

The male above noted has the legs piceous-black, and the same condition exists in one of the females. Two other females have the legs normally red throughout, the species is apparently variable therefore in this respect. It may be distinguished from *punctulata* by its smaller size and much sparser, feebler pronotal punctures, as well as the more approximate eyes of the female, although in the male they do not appear to be quite as approximate as in the corresponding sex of *punctulata*. As remarked by Mr. Champion, *erythrocnemis* is allied to the Mexican *lævicollis*, but the latter differs in its longer, more slender form and still sparser, more unevenly dispersed pronotal punctuation.

*Erythrocnemis* probably inhabits the Mississippi valley as far to the northward as southern Illinois.

**L. atra** Say.—Journ. Ac. Phil., V, 1827, p. 242; *nigrans* Melsh: Proc. Ac. Phil., III, 1846, p. 60.—Elongate-oval, strongly convex, black throughout, the tarsi alone paler, rufescent, polished throughout, the pubescence moderate in length, coarse, fulvous, rather sparse. *Head* coarsely, very sparsely, unevenly punctate, the eyes moderate or small; antennæ slender and filiform. *Prothorax* rather long, two-fifths wider than long, the apex truncate, fully three-fourths as wide as the base, the latter transverse, with the sinuations broad and deep; basal angles right; sides parallel and straight in basal two-thirds, then arcuate and convergent to the apex; disk unusually convex, not

at all impressed, not very coarsely, rather feebly, evenly, sparsely punctate, the basal foveæ broadly impressed, distinct. *Elytra* a little more than three times as long as the prothorax and scarcely at all wider, gradually, acutely ogival in apical two-fifths; sides parallel, nearly straight; disk very coarsely, deeply striate, the stria punctures unusually coarse and deep toward base but totally obsolete toward apex, the intervals rather convex, finely, sparsely, confusedly punctate. *Abdomen* finely but strongly, sparsely punctate. *Legs* slender; basal joint of the hind tarsi equal in length to the remainder.

*Male*.—Not examined.

*Female*.—Eyes separated by their own width; third and fourth antennal joints equal; tarsal characters similar to those of *punctulata*.

Length 7.5 mm.; width 2.7–2.9 mm. ♀.

Connecticut; Pennsylvania.

The present species is chiefly notable for its extreme northern habitat. The eyes are much smaller than in any of the others here enumerated, and it is also remarkable in having the punctures of the elytral striæ unusually coarse and conspicuous toward base; but, as is often the case, they become completely obsolete toward apex.

#### **HYMENORUS** Muls.

The two genera *Lobopoda* and *Hymenorus* are peculiarly American, and together comprise probably more than one-half of the entire family in our continent, the former being essentially tropical but entering the southern parts of the United States in moderate number, and the latter northern in its distribution but overrunning Mexico with many species. *Hymenorus* is a nearctic, and, to some extent also, a palæarctic genus, while *Lobopoda* is entirely neotropical. *Hymenorus* is one of the best defined of our genera, although the species are comparatively diversified in facies. The species are as a rule much smaller than those of *Lobopoda*.

The lobes of the tarsi in *Hymenorus* generally differ from those of *Lobopoda* in being small, and never more than two in number on the two anterior and one on the posterior pair. The last joint of the maxillary palpi is usually in the form of a right angled triangle, with the apex and the outer side subequal in length, but rarely it becomes more dilated and quite similar to the prevailing type in *Lobopoda* and *Allecula*. The anterior coxæ are always separated by a narrow but distinct prosternal process, and the posterior by a narrow acutely angulate abdominal projection, the entire structure

of the under surface being surprisingly constant throughout the genus when compared, for example, with that of *Mycetophila*.

The posterior tarsi are always slender, with the basal joint elongate and sometimes slightly less, but often much greater, in length than the remainder. The punctuation and pubescence are, as a rule, rather dense, the latter pale, somewhat short, coarse and conspicuous. The eyes are generally moderate and subequal in size in the two sexes, but sometimes larger, approaching the form seen in *Lobopoda*; they are then nearly always subject to the sexual modifications characterizing that genus. The antennæ are usually slender and filiform, moderate in length, with the joints more or less obconical, sometimes stouter and distinctly attenuate toward apex, the third joint being nearly always equal to or slightly longer than the fourth and similar in the sexes, but in a moderate number of species becoming very short in the male, although still normal in the female.

The general form of the body is oblong or oval, rather compact, with the prothorax subequal in width to the base of the elytra, the humeri never being in the least broadly exposed at base. The elytra are almost invariably distinctly punctate-striate, although in many cases the stria punctures become obsolete toward apex as in *Lobopoda*, and in one instance—*inquilinus*—the striae are completely effaced throughout, being traceable with great difficulty only in the immediate neighborhood of the base.

While the species are usually constant and easily separable among themselves by marked structural differences, sexual or otherwise, I have found the tabular classification of them a most difficult and unsatisfactory problem. None of the structural peculiarities so valuable in separating allied forms, continue constant throughout a sufficient number of species to enable us to define large groups with rigorous exactness, and I have been forced finally to adopt a method of subdivision depending largely upon general habitus and sculpture.

There are probably but few species common to the United States and Mexico, at least below the latitude of Durango. Mr. Champion has kindly sent me representatives of his *emmenastoides*, *pallidus*, *colonoides*, *guatemalensis* and *americanus*, all of which are widely different from any species which we possess. The densely punctate species, so characteristic of the southwestern fauna, are for the most part more or less local in distribution, contrasting strongly



in this respect with the more northern and eastern polished and sparsely punctate forms.

It is hoped that the following table may aid somewhat in identification, but as there are undoubtedly many species yet to be discovered, it will probably prove more or less ambiguous unless used solely as a key to the descriptions:—

Punctuation of the elytral intervals confused or forming more than a single series .....	2
Punctuation of the elytral intervals forming a single even series.....	23
<b>2</b> —Entire upper surface polished, the pronotal punctuation sparse; basal joint of the hind tarsi generally much longer than the remainder; antennæ variable in length and structure, the third joint often sexually modified.....	3
Upper surface generally more or less dull, the pronotum densely punctured; third joint of the antennæ not noticeably modified sexually.....	8
<b>3</b> —Third antennal joint of the male equal or subequal in length to the fourth.....	4
Third antennal joint of the male distinctly shorter than the fourth.....	7
<b>4</b> —Elytral striæ obsolete toward apex .....	5
Elytral striæ distinct throughout the length .....	6
<b>5</b> —Elytra with a large humeral red spot; size very small....	1 <b>humeralis</b>
Elytra without basal pale area.	
Antennæ short, barely two-fifths as long as the body.	
Prothorax strongly rounded at apex .....	2 <b>niger</b>
Prothorax much shorter and more transverse; subtruncate at apex.	
	3 <b>infuscatus</b>
Antennæ long, about one-half as long as the body; size much larger.	
	4 <b>picipennis</b>
<b>6</b> —Prothorax strongly transverse; eyes small, separated by nearly one-half more than their own width in the male .....	5 <b>punctulatus</b>
Prothorax longer; eyes larger, separated by their own width or but slightly more.	
Pronotum finely or moderately coarsely punctate.	
Form slender, parallel; antennæ short, scarcely more than one-third as long as the body .....	6 <b>melsheimeri</b>
Form broad, oval; antennæ fully two-fifths as long as the body.	
	7 <b>obesus</b>
Pronotum coarsely, deeply punctate .....	8 <b>pilosus</b>
<b>7</b> —Antennæ long, fully one-half as long as the body; pronotal punctuation coarse.	
Third joint (male) much longer than the second and more than one-half as long as the fourth.	
Intermediate joints of the antennæ strongly obconical, scarcely twice as long as wide; prothorax long and subequal in width to the base of the elytra.....	9 <b>difficilis</b>

- Intermediate joints feebly obconical, much more than twice as long as wide; prothorax much shorter and more transverse, distinctly narrower than the base of the elytra .....10 **perforatus**
- Third joint (male) but slightly longer than the second and rather less than one-half as long as the fourth.....11 **curticollis**
- Antennæ shorter, about two-fifths as long as the body.  
Pronotum rather finely punctured, strongly but broadly rounded at apex.  
12 **obscurus**
- Pronotum shorter, coarsely punctate, broadly, feebly arcuate at apex, the sides less convergent from the basal angles; size much smaller.  
13 **communis**
- 8**—Eyes large, separated by a distance which in neither sex exceeds one-half of their width; antennæ generally notably long; basal joint of the hind tarsi usually much longer than the remainder.....9
- Eyes small or moderately large, always separated by more than one-half of their own width, usually similar in the sexes; antennæ generally short; basal joint of the hind tarsi variable.....14
- 9**—Pronotum finely punctate.....10
- Pronotum coarsely punctate.....13
- 10**—Pronotal punctures very densely crowded, the interspaces not distinct...11
- Pronotal punctures dense but not in close contact, the interspaces distinct...12
- 11**—Elytra polished, the punctuation rather sparse.....14 **discrepans**
- Elytra dull and alutaceous.
- Larger species, not less than 7 mm. in length.  
Punctures of the elytral intervals very fine, feeble and moderately dense; abdomen not noticeably more densely punctate along the middle in the male.....15 **grandicollis**
- Punctures of the intervals fine but deep, excessively dense; abdomen very densely punctate along the middle in the male.....16 **apacheanus**
- Small species, not exceeding 4 mm. in length.....17 **exiguus**
- 12**—Color pale ochreous testaceous throughout; posterior femora unusually robust; antennæ very long, much more than one-half as long as the body.  
18 **helvinus**
- Color piceous-black, the posterior femora normal.
- Elytra not more than twice as long as wide.  
Head polished, very finely and sparsely punctate behind; antennæ longer; size larger.....19 **porosicornis**
- Head coarsely, deeply, more densely punctate; antennæ shorter, the joints less elongate .....20 **intermedius**
- Elytra distinctly more than twice as long as wide; body elongate, parallel.  
21 **prolixus**
- 13**—Body elongate or oblong.  
Antennæ less than one-half as long as the body; very large species.  
22 **occidentalis**
- Antennæ more than one-half as long as the body in the male, notably shorter in the female.

- Ferruginous, the elytra black in apical two-thirds .....23 **dorsalis**  
Piceous-black throughout .....24 **discretus**  
Body oval, the elytra in the middle much wider than the prothorax, the sides almost continuous in curvature with those of the latter...25 **convexus**  
**14**—Form oval, the elytra in the middle much wider than the prothorax, the sides arcuate and subcontinuous with those of the latter.....15  
Form oblong or oblong-oval, the elytra subequal to or slightly wider than the prothorax, with the sides parallel and straight or very nearly so, and the humeri generally narrowly rounded for a slight distance to the base of the prothorax .....16  
**15**—Elytra piceous-black, the head and prothorax more or less rufo-ferruginous and dull.  
Eyes separated by much less than their own width.....26 **densus**  
Eyes separated by distinctly more than their own width.....27 **ruficollis**  
Color uniform throughout.  
Punctures of the elytral striæ very coarse, rounded, perforate.  
Antennæ less than one-half as long as the body.....28 **dissensus**  
Antennæ long, distinctly more than one-half as long as the body.  
29 **seriatus**  
Punctures of the elytral striæ fine, linear.....30 **testaceus**  
**16**—Punctures of the elytral intervals fine and rather sparse, the elytra somewhat strongly shining .....17  
Punctures of the elytral intervals rather deeper, very dense, the lustre generally dull throughout, the elytra rarely slightly polished .....20  
**17**—Elytra not at all wider than the prothorax.....18  
Elytra wider than the prothorax, very slightly so in *tenellus*, but otherwise distinctly .....19  
**18**—Prothorax slightly inflated toward base and rather wider than any part of the elytra.  
Elytra with distinct series of punctures; color piceous-black; head distinctly, rather closely punctate .....31 **rotundicollis**  
Elytra with scarcely a trace of punctured series or impressed lines; color pale; head extremely sparsely punctured .....32 **inquilinus**  
Prothorax not inflated toward base and equal in width to the elytra; antennæ very stout, compressed, and attenuate toward apex, at least in the female.  
33 **fusicornis**  
**19**—Antennæ fully one-half as long as the body, the latter elongate, parallel and depressed.....34 **nitidipennis**  
Antennæ distinctly less than one-half as long as the body, the latter strongly convex.  
Larger species; pubescence long; pronotal punctures very coarse and densely crowded .....35 **inæqualis**  
Smaller species, the pubescence moderate in length; pronotal punctures finer, not in mutual contact at least toward the middle of the disk.  
Elytral striæ extremely fine and scarcely at all impressed laterally; body slender.....36 **tenellus**

- Elytral striæ unusually coarse and distinctly impressed.  
 Prothorax short and transverse, the sides parallel in basal half. 37 **sobrinus**  
 Prothorax longer, the sides convergent from the basal angles. 38 **floridanus**  
**20**—Body rather strongly convex.....21  
 Body distinctly depressed.....22  
**21**—Prothorax shorter, not less than one-half wider than long.  
 Eyes separated by scarcely two-thirds of their own width...39 **confertus**  
 Eyes separated by distinctly more than two-thirds of their width.  
 Elytral punctuation a little sparser, similar to that of *confertus*. 40 **fuscus**  
 Elytral punctuation excessively dense, similar to that of *punctatissimus*. 41 **macer**  
 Prothorax unusually long, but slightly more than one-third wider than long;  
 elytral punctuation excessively dense.....42 **indutus**  
**22**—Antennæ very short, the intermediate joints barely longer than wide. 43 **punctatissimus**  
 Antennæ longer, the joints distinctly longer than wide.  
 Elytral striæ rather coarse and distinct, the punctures of the intervals  
 moderately fine and unusually strong.....44 **deplanatus**  
 Elytral striæ exceedingly fine, feebly impressed, the punctures of the inter-  
 vals fine and much sparser.....45 **gemellus**  
**23**—Strongly polished and pale flavo-testaceous throughout. 46 **uniseriatus**

1 **H. humeralis** Lec.—N. Spec. Col., 1866, p. 135.—Elongate-oval, moderately convex, polished, piceous-black throughout; antennæ fuscous; legs pale flavate; each elytron with a large suffused basal pale area; pubescence long, moderately dense, semi-erect, pale and conspicuous. *Head* feebly convex, rather finely but deeply, somewhat densely punctate throughout, the eyes rather small, separated by one-fourth more than their own width; antennæ somewhat robust, nearly two-fifths as long as the body, the joints feebly obconical, not quite twice as long as wide, the third scarcely as long as the fourth. *Prothorax* about three-fifths wider than long, the apex strongly arcuate and continuous with the sides, the latter becoming gradually less strongly arcuate and nearly parallel in basal third, the angles right, not rounded; base transverse, the sinuations rather broad but distinct; disk very feebly impressed along the middle toward base, rather coarsely, sparsely punctate. *Elytra* three times as long as the prothorax, and, at the middle, very slightly wider than the latter, gradually, acutely ogival at apex, the sides parallel, feebly arcuate and continuous with those of the prothorax; disk with feebly impressed series of rather fine punctures, the intervals finely, confusedly, sparsely and somewhat unevenly punctate, the punctures but slightly smaller than those of the striæ. *Abdomen* finely but strongly, moderately sparsely punctured. *Legs* very slender, the basal joint of the hind tarsi one-half longer than the remainder. Length 4.5 mm.; width 1.6 mm.



Kentucky. Cab. LeConte.

The unique representative is a male, and is not in very good condition for observation. In this specimen the intromittent organ is far extruded, and the curious hinged spike protrudes from the groove along its lower surface in a nearly perpendicular direction.

The fourth joint of the maxillary palpi is rather short and robust, the apex scarcely as long as the outer side.

This remarkable species is quite similar in general appearance to certain members of the genus *Mycetophila*, especially *M. megalops*, and the slender tarsi, with unusually small narrow and inconspicuous lobes, add to this superficial resemblance an element which may indicate a still closer affinity. It is readily distinguishable, however, from any of those species of *Mycetophila* which it most nearly resembles, by its punctate-striate elytra and altogether different form of the prothorax, the latter being strongly rounded at apex.

2 **H. niger** Melsh.—Proc. Ac. Phil., III, 1846, p. 59.—Elongate-oval, rather convex and slender, highly polished throughout, black above, piceous-black beneath, the abdomen sometimes more rufescent; legs and antennæ piceous-black, the femora toward base and the tarsi paler, rufous; pubescence coarse, rather long, moderately dense. *Head* somewhat coarsely, sparsely punctate, the eyes moderate, separated by a little more than their width; antennæ rather short, moderately slender, filiform, two-fifths as long as the body, the joints almost parallel, fully twice as long as wide, the third and fourth equal, elongate. *Prothorax* three-fifths wider than long, broadly parabolic anteriorly, the sides divergent posteriorly and moderately arcuate, becoming parallel and nearly straight in less than basal third, the angles nearly right, slightly blunt; base transverse, the sinuations narrow and moderate; disk scarcely impressed, finely, very sparsely punctate, the punctures generally separated by three or four times their own diameters. *Elytra* nearly three and one-half times as long as the prothorax and not appreciably wider, rather gradually, acutely rounded behind; sides parallel and nearly straight; disk with almost completely unimpressed series of small but deep punctures, the series entirely obsolete toward apex, more distinct toward base, the intervals finely but deeply, sparsely punctate. *Abdomen* finely, sparsely punctate, the metasternum rather coarsely, sparsely so externally. *Legs* slender, the basal joint of the hind tarsi fully one-third longer than the remainder. Length 5.3–6.0 mm.; width 2.1–2.4 mm.

Canada; Pennsylvania; Florida; Texas.

The individual above described is a male from Pennsylvania, and represents the typical form. The numerous specimens before me are divisible into six sections, which are in all probability distinct species, but time and material are wanting to definitely fix their values

at present. One of these, represented by twelve specimens, is rather more slender than the type, with bright flavate legs and piceous upper surface, the elytra being feebly and suffusedly rufescent toward base. Another, represented by a single specimen from Florida, has the pronotum rather coarsely punctate, and the eyes larger. Still another, represented by a single male from Indiana, is larger, with the pronotum very finely punctate, the eyes being large and separated by less than their own width.

At a future time, with more material, it will be my endeavor to properly define these allied forms.

3 **H. infuscatus** n. sp.—Oblong-oval, moderately convex, polished throughout, dark brownish-piceous, the under surface and legs slightly paler, rufescent; pubescence rather long and coarse, somewhat sparse but conspicuous. *Head* feebly convex, rather coarsely but feebly, sparsely punctate; eyes small, separated by two-fifths more than their own width; antennæ slender, the third and fourth joints slender and equal. *Prothorax* transverse, about four-fifths wider than long, the apex broadly, feebly arcuate, three-fifths as wide as the base, the sides very strongly rounded and convergent anteriorly, becoming parallel and almost straight in basal half, the basal angles right and narrowly rounded; base transverse and straight laterally, broadly, roundly lobed in the middle, the lobe more prominent posteriorly than the lateral portions; disk obsoletely impressed toward base in the middle and in the position of the usual foveæ, rather coarsely and sparsely punctate. *Elytra* four times as long as the prothorax, and, behind the middle, just visibly wider than the latter, acutely ogival in apical third; sides very feebly arcuate, especially behind, thence nearly straight to the base and continuous with those of the prothorax; disk with feebly impressed rows of rather small but distinct, rounded punctures which become obsolete toward apex, the intervals feebly convex, finely, confusedly and rather sparsely punctate. *Abdomen* minutely, sparsely punctate throughout. *Legs* slender, the basal joint of the hind tarsi equal in length to the remainder. Length 5.7 mm.; width 2.2 mm.

California (Los Angeles).

The single specimen before me is a male. The species does not greatly resemble any other, although perhaps most closely allied to *niger*. The pubescence is unusually long, and the prothorax short and coarsely punctate.

4 **H. picipennis** n. sp.—Oblong-oval, rather feebly convex, piceous-black above, the elytra slightly paler, piceous; under surface piceous-black, the legs concolorous; tarsi and antennæ slightly paler, dark brown; surface highly polished throughout, the pubescence moderate in length, coarse, pale, decidedly sparse. *Head* very sparsely, coarsely punctate, the eyes rather large, separated by two-thirds to three-fourths their own width; antennæ

long, somewhat robust, one-half as long as the body, the joints equal in length throughout, the intermediate strongly obconical and nearly twice as long as wide, the third very long, cylindrical and slightly longer than the fourth. *Prothorax* two-thirds to three-fourths wider than long, somewhat parabolic and strongly rounded at apex, the sides becoming parallel and distinctly arcuate in basal half to two-thirds, the angles nearly right, not rounded; base transverse, the sinuations rather narrow and distinct; disk scarcely impressed, very finely and sparsely, somewhat feebly punctate. *Elytra* four times as long as the prothorax and subequal to the latter in width, gradually very acutely ogival toward apex, the sides parallel and scarcely visibly arcuate; disk with feebly impressed series of punctures, which are rather coarse and distinct toward base, but almost completely obsolete toward apex, the intervals minutely very sparsely punctate, these punctures becoming rather coarser and more asperate toward apex. *Abdomen* minutely, sparsely punctate throughout. *Legs* slender; femora rather robust, sparsely punctate; basal joint of the hind tarsi unusually long, fully one-half longer than the remainder. Length 7.0 mm.; width 2.6–2.8.

#### Michigan.

The species above described is not likely to be confounded with any other, being distinguishable by its long antennæ with strongly obconical joints, the third a little longer than the fourth—which is unusual in this section,—its larger eyes and incomplete elytral series. It also differs in its very fine, extremely sparse pronotal punctuation. The two specimens before me are apparently females.

**5 *H. punctulatus*** Lec.—Proc. Ac. Phil., 1859, p. 78.—Oblong-oval, moderately convex, polished and pale rufo-testaceous throughout, the pubescence fine, short, subrecumbent, pale but rather sparse and not conspicuous. *Head* rather large and strongly convex, somewhat coarsely, sparsely punctate, the eyes small, separated by two-fifths more than their own width; antennæ rather short and robust, distinctly attenuate toward apex, but little more than one-third as long as the body, the intermediate joints somewhat feebly obconical, the third and fourth subequal. *Prothorax* strongly transverse, about twice as wide as long, the apex broad and subtruncate, the base transverse, broadly, feebly arcuate in the middle; sides broadly arcuate and convergent in apical two-fifths, thence nearly parallel to the basal angles which are obtuse and rather blunt; disk scarcely at all impressed, finely, rather densely punctate, the punctures separated by about twice their own diameters. *Elytra* nearly five times as long as the prothorax and rather distinctly wider, somewhat abruptly ogival in apical third; sides parallel and just visibly arcuate; humeri rounded and oblique externally, but not exposed at base; disk with feebly impressed series of fine, rather approximate punctures, the intervals minutely, confusedly and somewhat sparsely punctate. *Abdomen* minutely, rather feebly and sparsely punctate. Length 6.3 mm.; width 2.6 mm.

California. Cab. LeConte.

Although bearing a general resemblance to the *obscurus* group of eastern species, *punctulatus* differs remarkably from all of them in its fine and much shorter pubescence. The type specimen is a male, and is in a poor state of preservation, the pronotum being broken and crushed so that it is somewhat distorted in outline; the above measurements have made allowance for this as far as possible. The posterior legs are entirely wanting in the type. It is distinguishable from *infuscatus* by its broader form, relatively shorter prothorax and longer elytra, shorter, stouter antennæ and short pubescence.

The antennæ are quite robust, unusually compact and cylindrical, with the third joint just visibly longer than the fourth and both of these much longer than joints five to eleven, which are equal in length, the fifth about one-half longer than wide, the tenth nearly two and one-half times as long as wide.

6 **H. melsheimeri** n. sp.—Oblong-elongate, parallel, moderately convex, piceous-black above, the entire under surface, legs and antennæ paler, rufo-ferruginous; surface polished; pubescence nearly as in *obscurus*. *Head* rather coarsely, deeply, sparsely punctate, the eyes moderate, separated by slightly more than their own width; antennæ short, stout, filiform, not more than one-third as long as the body, the last three joints rapidly shorter, joints three to nine equal in length, the intermediate almost parallel, twice as long as wide. *Prothorax* three-fourths wider than long, the apex broadly arcuate, continuous in curvature around the apical angles, the sides becoming parallel and feebly arcuate almost through basal two-thirds; basal angles right, not rounded; base transverse, with a short rounded median lobe; disk obsoletely impressed only along the middle toward base, finely, sparsely punctate, the punctures round, perforate and separated by about three times their own diameters. *Elytra* nearly four times as long as the prothorax and equal to it in width, rather gradually, acutely pointed in apical third; sides parallel and nearly straight; disk with feebly impressed series of fine, not very close-set and inconspicuous punctures, the intervals minutely, sparsely punctate. *Abdomen* finely, sparsely punctate. *Legs* slender; basal joint of the hind tarsi nearly one-half longer than the remainder, slightly arcuate. Length 7.3 mm.; width 2.7 mm.

Michigan.

The unique specimen before me is immediately distinguishable from any other in this section by its narrower, more parallel form, and unusually short, rather stout, but filiform antennæ, with nearly parallel-sided joints. The sex of the type cannot be definitely determined without dissection.



7 **H. obesus** n. sp.—Broadly oblong-oval, rather strongly convex, polished throughout, piceous-black, the abdomen black; legs piceous, the tarsi paler; antennæ rufo-fuscous; pubescence moderate in length, rather sparse, coarse, pale in color. *Head* sparsely, somewhat coarsely punctate; eyes moderate, separated by a little less (male), or a little more (female), than their own width; antennæ slender, filiform, two-fifths as long as the body, the joints nearly parallel, gradually slightly shorter toward apex, the third a little shorter than the fourth in the male, slender, the fourth three times as long as wide. *Prothorax* two-thirds to three-fourths wider than long, the apex two-thirds as wide as the base, broadly arcuate, the sides parallel and feebly arcuate in basal half, thence rather strongly convergent and arcuate to the apex; basal angles distinctly obtuse and blunt; base transverse, the sinuations rather broad and feeble; disk scarcely at all impressed, moderately coarsely, strongly, sparsely punctate. *Elytra* from three and one-half to nearly four times as long as the prothorax, toward base barely perceptibly wider than the prothorax, a little more distinctly so posteriorly, rather broadly, obtusely ogival at apex; sides feebly arcuate; disk with feebly impressed series of small, deep, close-set punctures, the intervals finely, rather sparsely punctate in the female, very sparsely so in the male. *Abdomen* finely, sparsely punctate throughout. *Legs* slender; basal joint of the hind tarsi much longer than the remainder. Length 6.7–8.0 mm.; width 3.2–3.5 mm.

New York.

The broadly oval form and more slender, filiform antennæ of this species will serve to distinguish it from *pilosus*, to which it is rather closely allied. The third antennal joint of the male is slightly shorter, and the outer joints decrease more conspicuously in length, than in *pilosus*, and the eyes in the same sex are distinctly larger.

8 **H. pilosus** Melsh.—Proc. Ac. Phil., III, 1846, p. 58.—Rather broad, oblong-oval, moderately convex, black or piceous black throughout, the abdomen, legs and antennæ concolorous, the tarsi paler, rufescent; surface polished throughout; pubescence moderate in length, pale, coarse, rather sparse but conspicuous. *Head* coarsely, deeply, somewhat sparsely punctate, the eyes moderate, separated by from one-third to one-fourth more than their own width; antennæ slender, filiform, two-fifths as long as the body, the joints quite distinctly obconical, more than twice as long as wide, the third and fourth long, exactly equal in both sexes. *Prothorax* three-fourths wider than long, the apex broadly arcuate, three-fourths as wide as the base, not evenly continuous with the sides, the latter convergent and almost evenly arcuate from base to apex in both sexes; basal angles right and distinctly blunt; base transverse, the sinuations rather broad and feeble; disk scarcely at all impressed, quite coarsely, deeply, strongly punctate, the punctures separated by two to three times their diameters in the male, rather closer in the female. *Elytra* nearly four times as long as the prothorax, and, at the middle, slightly wider, rather obtusely rounded behind, the sides parallel and just visibly

arcuate, the humeri broadly oblique to the base of the prothorax; disk with distinctly impressed series of small deep punctures, the intervals sparsely, finely punctate in both sexes. *Abdomen* minutely, very sparsely punctate throughout, rather more closely so in the female, the metasternum coarsely, sparsely so externally. *Legs* slender, the basal joint of the hind tarsi one-third longer than the remainder. Length 7.0–8.0 mm.; width 2.9–3.2 mm.

Massachusetts; Michigan; Virginia.

This species is more northern in distribution than *obscurus*, and is easily distinguishable by its shorter prothorax, coarser punctuation, rather broader, more depressed form, black color and long third antennal joint of the male. The series before me is quite homogeneous.

Two specimens from Florida are not included in the measurements given above, as they appear to represent a much smaller, though very closely allied species. It will require larger series to definitely solve this question.

**9 *H. difficilis* n. sp.**—Elongate, sub-oval, rather strongly convex, piceous-black throughout, the tarsi paler; surface highly polished, the pubescence rather long, coarse, pale, moderately dense. *Head* coarsely punctate, the punctures very sparse between the eyes, but dense along the base; eyes moderate, separated by their own width; antennæ about one-half as long as the body, robust, strongly compressed, feebly attenuate, joints four to eleven equal in length, very strongly obconical, nearly twice as long as wide, the third joint short, about two-thirds as long as the fourth in the male. *Prothorax* long, about one-half wider than long, broadly, rather strongly arcuate at apex, the sides parallel or very feebly convergent and nearly straight in basal two-thirds, then rounded into the apex; basal angles right, not at all rounded; base transverse, the sinuations very broad, distinct; disk with obsolete median sub-basal impression, very coarsely, deeply punctate, the punctures round, separated by nearly twice their own widths. *Elytra* about three and one-half times as long as the prothorax, and, in the middle, slightly wider, rather obtusely ogival at apex; sides parallel and just visibly arcuate; disk with unusually broadly, deeply impressed series of punctures, which are coarse, deep and very conspicuous toward base, but finer, though still distinct, toward apex; intervals rather strongly convex toward the suture, finely, sparsely punctate. *Abdomen* finely, very sparsely punctate throughout. *Legs* slender; basal joint of the hind tarsi distinctly longer than the remainder, though rather shorter than usual in this section. Length 7.3 mm.; width 3.0 mm.

New York.

The unique type is a male. The species is not very closely related to any other, and may be distinguished from *pilosus* by its more slender form, more elongate prothorax and short third antennal

joint of the male. From *obscurus* it may be known by its coarser pronotal punctuation, and more robust and compressed antennæ with more strongly obconical joints and with longer third joint in the male, and finally from *perforatus*, by its longer, rather less coarsely and more evenly punctate pronotum, much shorter antennæ and relatively narrower elytra.

10 **H. perforatus** n. sp.—Oblong, moderately convex, polished throughout, dark piceous-brown, the legs and antennæ slightly paler and more ferruginous; pubescence rather long, coarse, semi-erect, pale, moderately dense and conspicuous. *Head* coarsely, deeply but rather sparsely punctate, the eyes rather large, separated by about their own width in the male; antennæ about one-half as long as the body, filiform, rather stout, the joints feebly obconical and more than twice as long as wide. *Prothorax* fully three-fourths wider than long, the apex broadly, strongly arcuate and continuous in curvature with the sides, which become parallel and feebly arcuate in basal half, the angles right, not rounded; base transverse, the sinuations broad and feeble; disk obsoletely impressed along the middle, the basal foveæ nearly obsolete, the surface very coarsely, deeply punctate, the punctures sparse, separated generally by nearly twice their own diameters. *Elytra* a little more than four times as long as the prothorax and about one-fifth wider, obtusely ogival in less than apical third; sides parallel and nearly straight, the humeri narrowly, abruptly rounded to the prothorax and exposed at base; disk with rather strongly impressed series of somewhat coarse, deep punctures, the intervals feebly convex, finely, sparsely, confusedly and rather unevenly punctured. *Abdomen* sparsely, finely punctate. *Legs* slender, the basal joint of the hind tarsi a little longer than the remainder. Length 7.5 mm.; width 2.8 mm.

Pennsylvania; Indiana; North Carolina.

The three specimens before me are males; in this sex the third antennal joint is fully two-thirds as long as the fourth.

Although belonging to the same division of the genus as *obscurus*, the present species differs greatly in its extremely coarse pronotal punctuation, and in having the elytra abruptly and distinctly wider than the prothorax.

11 **H. curticollis** n. sp.—Oblong-oval, rather depressed, black with a piceous tinge throughout, the tarsi, antennæ near the base and palpi paler, rufescent; surface highly polished, the pubescence coarse, pale, sparse and unusually long. *Head* coarsely, deeply, rather sparsely punctate, the eyes moderate, separated by scarcely their own width in the male and but slightly more in the female, the antennæ slender, filiform, scarcely perceptibly compressed, rather more than one-half as long as the body, the joints strongly obconical, twice as long as wide, the third very short in the male and scarcely one-half as long as the fourth. *Prothorax* short, fully four-fifths wider than

long, strongly but broadly arcuate at apex, thence broadly but more strongly arcuate laterally, the sides becoming feebly divergent and feebly arcuate to the basal angles, which are right and distinctly blunt; base transverse, the sinuations narrow and strong; disk scarcely impressed, coarsely, deeply, sparsely punctate. *Elytra* nearly four times as long as the prothorax, and, in the middle, just visibly wider in the male, quite distinctly wider behind the middle in the female, rather obtusely ogival at apex, the sides very feebly arcuate, becoming nearly straight toward base; disk with rather distinctly impressed series of moderately coarse, deep, punctures, the intervals finely, sparsely punctate. *Abdomen* finely, sparsely punctate. *Legs* slender, the basal joint of the hind tarsi much longer than the remainder. Length 5.7–6.5 mm.; width 2.4–2.8 mm.

#### Iowa.

A somewhat small, broadly depressed species for the present section of the genus, with rather short prothorax, the sides of which are unusually convergent from the base. It is easily recognizable by its longer, more shaggy pubescence, as well as by the antennal structure of the male.

The anterior tarsi of the male have the third joint very rudimentarily lobed, the fourth distinctly so; the intermediate and posterior tarsi having simply the penultimate joint lobed beneath.

12 **H. obscurus** Say.—Journ. Ac. Phil., V, 1827, p. 242.—Oblong-oval, strongly convex, blackish-piceous, the abdomen, legs and antennæ slightly paler, rufo-piceous, polished throughout, the pubescence rather long, coarse, pale, moderately dense and conspicuous. *Head* somewhat coarsely, sparsely punctate, the eyes moderate, separated by about their own width in both sexes; antennæ slender, filiform, two-fifths as long as the body, joints four to eleven equal in length, barely perceptibly obconical, much more than twice as long as wide, the third very short and one-half as long as the fourth in the male, long and fully equal to the fourth in the female. *Prothorax* rather long, but slightly more than one-half wider than long, almost semi-circularly rounded in anterior half, the sides thence feebly divergent (male), or parallel (female) to the base and feebly but distinctly arcuate; basal angles right and slightly blunt; base transverse, the sinuations narrow and strong; disk obsoletely impressed in the middle toward base, and also in the position of the basal foveæ, not very coarsely, deeply, sparsely punctate. *Elytra* scarcely three and one-half times as long as the prothorax, and, toward base, equal in width to the latter, somewhat broader behind the middle in the male, almost parallel in the female, the apex rather abruptly ogival; disk with rather strongly, broadly impressed series of small, rounded, distinct punctures, the intervals rather closely punctate in the female, more sparsely so in the male. *Abdomen* finely, sparsely punctate throughout in both sexes, the metasternum very coarsely, sparsely so externally, gradually finely and more densely so



toward the middle. *Legs* slender; basal joint of the hind tarsi fully one-third longer than the remainder. Length 6.2–7.5 mm.; width 2.7–3.1 mm.

Texas; New York.

The typical form above described is from Texas, the Long Island specimen being quite similar, except that the pronotum is rather more finely punctured and the elytral series not so strongly impressed, tending to disappear laterally toward apex. It is singular that in these species the elytral punctuation of the male is quite distinctly sparser than that of the female, but the antennæ seem to be about equal in length in the two sexes. Still more striking sexual differences in punctuation will be alluded to under *discretus*.<sup>1</sup>

This species is easily separated from the others of this section by the characters given in the table.

13 **H. communis** Lec.—New Spec. Col., 1866, p. 135.—Oblong-oval, rather pale rufo-castaneous throughout, polished, the pubescence moderate in length, coarse, pale, rather sparse. *Head* coarsely, sparsely punctate; eyes moderate, separated by slightly more than their own width; antennæ (male) slender, filiform, two-fifths as long as the body, joints five to eleven equal in length, very slightly obconical, distinctly more than twice as long as wide and each a little shorter than the fourth, the latter about twice as long as the third. *Prothorax* two-thirds wider than long, broadly, strongly arcuate at apex, the sides feebly convergent from the base nearly to the apex and rather strongly evenly arcuate; basal angles scarcely more than right, not distinctly blunt; base transverse, the sinuations broad and rather feeble, disk scarcely impressed, rather coarsely, sparsely punctate, the punctures separated by two to three times their width. *Elytra* equal in width to the prothorax and nearly three and one-half times as long, rather abruptly, obtusely ogival at apex, the sides parallel and nearly straight; disk with distinctly impressed series of rather coarse deep punctures, which extend distinctly to the apex; intervals finely, very sparsely punctate. *Abdomen* finely but strongly, sparsely punctate. *Legs* slender, the basal joint of the hind tarsi much longer than the remainder. Length 5.3 mm.; width 2.2 mm.

North Carolina.

The description is drawn from the male as I have not positively identified the female. In this male type the last joint of the maxillary palpi is rather large and elongate, but almost perfectly rectitriangular, with the outer side subequal to the apex, and the elytral series are distinct to the apex.

This is the smallest species of the present group except *humeralis*, and does not appear to be at all common.

<sup>1</sup> The sparser elytral punctuation of the male is also a common character in *Lobopoda*.

14 **H. discrepans** n. sp.—Elongate-elliptical, rather strongly convex; prothorax rather dull, the elytra polished; body dark piceous-brown in color, the legs scarcely paler, the abdomen and antennæ paler and more rufescent; pubescence rather long, coarse, subrecumbent, pale, sparse and somewhat conspicuous. *Head* coarsely and rather sparsely punctate, polished; eyes large, separated by two-fifths their width; antennæ somewhat slender, not attenuate, two-fifths as long as the body, the joints very feebly obconical, nearly twice as long as wide, the third subequal in length to the fourth but much more slender. *Prothorax* nearly two-thirds wider than long, the apex broadly arcuate, but slightly more than one-half as wide as the base, the latter transverse, with the sinuations very small but distinct; sides broadly rounded and strongly convergent anteriorly, nearly straight and parallel in basal two-fifths, the basal angles right and not at all rounded; disk not noticeably impressed, not very coarsely and extremely densely punctate, the punctures closely crowded and the lustre dull. *Elytra* three and one-half times as long as the prothorax, and, at the middle, but very slightly wider, gradually and acutely ogival in more than apical third; sides feebly arcuate and continuous with those of the prothorax; disk with fine, feebly impressed striæ of rather small but distinct punctures, the intervals finely and sparsely punctured. *Abdomen* finely, sparsely punctate. *Legs* slender, normal. Length 5.5 mm.; width 2.1 mm.

California.

This is quite a distinct species, readily distinguishable by its extremely densely crowded punctuation of the pronotum and correspondingly sparse elytral punctures, also by its large eyes and rather long pubescence. The fifth ventral segment is broadly feebly impressed in the single specimen before me, which is probably a male.

15 **H. grandicollis** Champ.—Biol. Cent.-Amer., Coleopt., IV, Pt. i, p. 429.—Oblong-oval, strongly convex, rather pale piceous-brown throughout, the under surface, legs and antennæ but slightly paler; lustre rather dull and alutaceous; pubescence short, rather fine, pale, moderately dense. *Head* somewhat densely punctured, the eyes in the male large and separated by one-fourth or one-fifth of their width; antennæ rather slender, two-fifths as long as the body, not at all attenuate, joints three to eleven equal in length, somewhat distinctly obconical and rather more than twice as long as wide. *Prothorax* nearly two-thirds wider than long, the apex broadly, rather strongly arcuate and almost continuous in curvature with the sides, the latter broadly, strongly arcuate, becoming slightly convergent and feebly arcuate toward base, the angles slightly obtuse but not rounded; base transverse, the sinuation at each side of the middle rather narrow but strong; disk not distinctly impressed, finely, very densely punctate and dull, the punctures rounded and deep near their anterior margins, shallow and evanescent posteriorly, the interspaces very minutely and strongly granulato-reticulate. *Elytra* three

times as long as the prothorax\* and exactly equal in width to the latter, gradually ogival in apical third; sides parallel and nearly straight in basal three-fifths; disk finely, feebly striate, the striae rather feebly and finely punctate, the intervals dull and alutaceous, finely, feebly, somewhat densely punctate. *Abdomen* finely, somewhat sparsely and evenly punctate throughout. *Legs* slender, the basal joint of the hind tarsi nearly one-third longer than the entire remainder. Length 7.0–7.3 mm.; width 2.8–3.0 mm.

#### Arizona.

A rather large, smooth and dull species, somewhat allied to *porosicornis* and resembling the latter almost perfectly in outline and size, but easily distinguishable by its dull lustre, finer and much denser punctuation and strikingly more elongate basal joint of the hind tarsi, the comparison being made from the males. In the present species the latter sex is the only one before me; the coloration in these two specimens is probably abnormally pale from immaturity.

16 **H. apacheanus** n. sp.—Oblong-oval, rather convex, dark blackish-castaneous above and beneath, the abdomen, legs and antennae slightly paler and rufescent; lustre dull; pubescence extremely short, dense, pale, subsericeous and moderately conspicuous, recumbent. *Head* dull, finely, very densely punctate anteriorly, more sparsely so between the eyes, which are large and separated by scarcely two-fifths their own width; antennae stout, just perceptibly attenuate, not quite two-fifths as long as the body, joints strongly obconical, the intermediate nearly twice as long as wide, the third just visibly longer than the fourth. *Prothorax* scarcely one-half wider than long, the apex broadly, strongly arcuate, not quite continuous in curvature with the sides, the latter broadly, strongly arcuate and convergent anteriorly, becoming gradually feebly arcuate and nearly parallel near the basal angles, which are right and very slightly blunt; base transverse, the sinuations small and rather strong, the median lobe subtruncate; disk scarcely at all impressed, rather finely, deeply, excessively densely punctate and dull, the punctures polygonally crowded throughout. *Elytra* a little more than three times as long as the prothorax and about one-fifth wider, rather gradually ogival in apical third; sides thence parallel and almost straight to the humeri, which are oblique externally but not exposed at base; disk with very feebly impressed series of small but rather deep punctures, the intervals finely but strongly, extremely densely punctate. *Abdomen* finely punctate, rather sparsely so except along the middle where the punctures become extremely dense. *Legs* long and slender, the basal joint of the hind tarsi distinctly longer than the remainder. Length 8.0 mm.; width 3.2 mm.

#### Arizona.

I am not quite sure of the sex of the single individual before me, but it appears to be a male. The species is exceedingly distinct in

its large size, unusually short, dense pubescence and excessively dense punctuation, not only of the pronotum, but also the elytra; on the latter the serial punctures are not distinct, being obscured by the crowded punctuation of the intervals.

The fourth joint of the maxillary palpi is normal, moderate in size, recti-triangular, the apex being subequal in length to the outer side.

This can hardly be the female of *grandicollis*, as the dense punctuation along the middle of the abdomen is always a male characteristic when it occurs in the allied *Tenebrionidæ*.

17 **H. exiguus** n. sp.—Oblong-oval, subparallel, rather convex, dark brownish-castaneous; under surface, legs and antennæ paler, more rufous; integuments above rather dull, the pubescence short, very dense, conspicuous. *Head* small, less than one-half as wide as the prothorax; clypeus and interocular surface finely but not densely punctate, polished; eyes large, separated by rather less than one-half their width; antennæ somewhat slender, about two-fifths as long as the body, joints five to ten moderately obconical, fully one-half longer than wide, three and four subequal, nearly cylindrical. *Prothorax* nearly three-fourths wider than long, the apex rather broadly but strongly arcuate, and almost perfectly continuous with the sides, the latter very broadly rounded anteriorly, becoming parallel and nearly straight only in basal third; basal angles scarcely more than right, not noticeably rounded; base transverse, the sinuations narrow but rather strong; disk evenly convex, not impressed, rather finely, extremely densely punctate, the punctures rather shallow, arcuate anteriorly, rapidly shallow and evanescent at their posterior extremities, in mutual contact in a transverse direction, which gives to the punctuation a vague appearance of transverse rugulation under low power. *Elytra* a little more than three times as long as the prothorax, and, throughout basal two-thirds, equal in width to the latter, gradually ogival at apex; sides parallel and barely perceptibly arcuate; disk finely, very densely punctate, with fine, extremely feebly impressed striæ which are just perceptibly punctate. Under surface shining, the abdomen finely, sparsely punctate. *Legs* moderate, the basal joint of the hind tarsi equal in length to the remainder. Length 4.0 mm.; width 1.7 mm.

Texas (El Paso). Mr. Dunn.

A small and inconspicuous species, which is however not closely related to any other here described. It may be known at once by its exceptionally small size and large eyes.

In the unique type the prosternum has been broken away at the sides, exposing the intercoxal process. This, viewed vertically upon its exposed surface, is well known to be longitudinally convex, strongly inflexed behind, arriving at the level of the prosternal side-



pieces at the hind margin. The exposure caused by the removal of the coxa, shows that this process is really a thin hoop, and, that below its surface, the cavities are almost confluent, being separated only by what appears to be a thin hyaline membrane; the inner edge of the hoop is ciliate.

18 **H. helvinus** n. sp.—Oblong-oval, subparallel, rather convex at the sides, flatter above, pale rufo-testaceous throughout, the head and prothorax very slightly darker and more brownish; lustre moderately shining; pubescence short, rather sparse, pale but inconspicuous. *Head* finely, rather densely punctate anteriorly, more sparsely so toward base, the eyes in the male very large and separated by one-fourth of their own width; antennæ long and rather stout, distinctly longer than one-half the body, joints strongly obconical, a little more serrate internally than externally, and fully twice as long as wide, third and fourth subequal in length. *Prothorax* large, two-fifths wider than long, the apex strongly arcuate and continuous in curvature with the sides, the latter broadly, strongly, nearly evenly arcuate throughout, the basal angles slightly obtuse but not rounded; base transverse, strongly sinuate at each side of the middle; disk perfectly even, without impressions, convex, distinctly wider behind the middle than at base, finely, densely punctate, the punctures all distinctly separated. *Elytra* three times as long as the prothorax, and, at the middle, equal in width to the disk of the latter; apex gradually, acutely ogival; sides parallel and very feebly arcuate, the two bases exactly equal; disk with very fine striæ which are generally very feebly impressed, but more distinctly so toward the suture, the punctures of the series fine, approximate and sublinear; intervals nearly flat, finely, rather densely and confusedly punctured. *Abdomen* somewhat coarsely but sparsely punctate, the prosternum densely so. *Legs* moderate in length, the femora robust, the posterior distinctly wider toward apex; tarsi slender, the basal joint of the posterior slightly longer than the remainder. Length 5.8–6.3 mm.; width 2.5 mm.

Texas. National Museum.

The specimens before me are males, and in this sex the last ventral segment is unimpressed, much longer than the fourth and strongly evenly rounded at apex.

This is a comparatively isolated species, readily known by the peculiar form of the prothorax, long antennæ, very large eyes and robust femora, as well as by its peculiar pale ochreous coloration. The prothorax is more than ordinarily deflexed, the longitudinal convexity of the body being therefore apparently greater than usual.

19 **H. porosicornis** n. sp.—Oblong-oval, subparallel, rather strongly convex, piceous-black above and beneath, the legs and antennæ slightly paler, rufescent; surface rather strongly shining, the pronotum finely, feebly

alutaceous; pubescence coarse, short, pale ochreous but sparse and not very conspicuous. *Head* rather large, polished, the epistoma flat, the vertex strongly, abruptly, longitudinally convex and finely, sparsely punctate; eyes large, separated by one-fifth their width in the male and two-fifths in the female; antennæ rather long and slender, two-fifths as long as the body in both sexes, feebly but distinctly attenuate, joints six to ten strongly obconical, the former a little less, the latter a little more than twice as long as wide, third distinctly longer than the fourth. *Prothorax* two-thirds wider than long, the apex broadly, strongly arcuate and continuous in curvature with the sides, the latter broadly, strongly arcuate anteriorly, parallel or very feebly convergent and feebly arcuate from the middle to the basal angles, which are slightly obtuse and very narrowly rounded; base transverse, the sinuation at each side of the middle narrow but strong; disk convex, not distinctly impressed, finely, rather densely punctate, the punctures round and separated by about their own diameters. *Elytra* fully three times as long as the prothorax and equal to the disk of the latter in width, gradually ogival at apex from slightly behind the middle; sides parallel and nearly straight in basal three-fifths; disk with very fine, feebly impressed series of fine but rather deep, close-set punctures, the intervals finely, confusedly and sparsely punctate. *Abdomen* finely, sparsely punctate. *Legs* moderate in length, rather robust, the basal joint of the hind tarsi subequal in length to the remainder. Length 6.4-7.5 mm.; width 2.3-2.8 mm.

Texas (El Paso). Mr. Dunn.

A distinct species, somewhat resembling *rotundicollis*, but much larger, more sparsely punctate and with larger, more approximate eyes which differ sexually.

The remarkable porous system of the antennæ is extremely developed in the present species. The pores are large and uniformly, rather sparsely distributed over the entire surface of the joints four to eleven; they are circular, rather deep, quite independent of the hairs or bristles, and are filled with a peculiar white stellated material, of a spongy-pubescent nature, somewhat similar to the sensitive structure filling the pronotal foveæ in many pselaphides.

This species approaches the genus *Mencœus*, but the thoracic angles are not in the least prolonged posteriorly.

20 **H. intermedius** n. sp.—Oblong-oval, moderately convex, blackish-castaneous, the under surface and antennæ rufo-fuscon; legs paler and more flavate; lustre rather shining, feebly alutaceous; pubescence moderate in length, pale, somewhat dense, very easily removable. *Head* very small, rather coarsely and densely punctate, the eyes large, separated by about one-half their width; antennæ fully two-fifths as long as the body, rather robust, feebly attenuate, the intermediate joints strongly obconical and scarcely more than one-half longer than wide, the third slightly longer than the fourth.

*Prothorax* nearly three-fifths wider than long, the apex strongly arcuate and continuous with the sides, the latter becoming parallel and distinctly arcuate toward base, the basal angles right, not distinctly blunt; base transverse, the sinuations moderate; disk very obsoletely impressed in the middle toward base, finely, deeply punctate, the punctures separated by scarcely their own widths, the interspaces rather strongly alutaceous. *Elytra* fully three times as long as the prothorax and equal in width to the latter, rather abruptly ogival in apical third; disk with feebly impressed series of small but distinct, not very approximate punctures, the intervals minutely and moderately closely punctured. *Abdomen* minutely, very sparsely punctate. *Legs* moderate; basal joint of the hind tarsi almost two-fifths longer than the entire remainder. Length 5.5 mm.; width 2.2 mm.

Texas. Mr. W. Jülich.

The general form of the body recalls *rotundicollis*, but the latter differs in its larger size, much smaller eyes and broader terminal joint of the palpi. In *intermedius* this joint is almost normal, recti-triangular, with the very oblique apex scarcely longer than the outer side. The head seems to be even unusually small.

There is but little variation of any kind in the three specimens before me.

21 **H. prolixus** n. sp.—Elongate, subparallel, moderately convex, alutaceous in lustre and rather dull, piceous to castaneous, the legs, abdomen and antennæ paler and more rufous; pubescence short, rather sparse and inconspicuous. *Head* finely punctate, nearly evenly and rather densely so throughout; eyes large, separated by one-third their width in the male, one-half in the female; antennæ long and slender, nearly one-half as long as the body, the joints strongly obconical and much more than twice as long as wide, the third and fourth equal. *Prothorax* one-half wider than long, the apex and sides nearly as in *occidentalis*; basal angles right and narrowly but very distinctly rounded; base transverse, the sinuations broad and strong, the median lobe broadly arcuate, projecting posteriorly as far as the basal angles; disk scarcely impressed, finely, deeply, densely punctate, usually slightly more sparsely so toward base, the punctures anteriorly generally distinctly, sometimes rather widely separated. *Elytra* fully four times as long as the prothorax and very slightly wider than the latter, rather gradually, obtusely ogival at apex; sides parallel and nearly straight, the humeri somewhat abruptly rounded to the prothorax; disk with very feebly impressed series of fine but deep, close-set, sublinear punctures, the intervals finely, confusedly and rather sparsely punctate. *Abdomen*, under surface and legs nearly as in *occidentalis*. Length 8.5–9.7 mm.; width 2.9–3.2 mm.

New Mexico; Arizona.

This species is somewhat related to *occidentalis*, but differs in several characters to a decisive degree. The punctuation of the

pronotum in *prolixus* is much finer and less dense, and the elytral punctures are decidedly sparser; the antennæ are more slender, with the joints more elongate, the comparisons being made from the male; the base of the prothorax is scarcely at all oblique toward the angles, and finally, the two sexes are similar in size and form, while in *occidentalis* the male is notably more slender than the female and with a less transverse prothorax.

The maxillary palpi are nearly as in *occidentalis*, but the fourth joint is rather narrower. I have seen six specimens.

Mr. Champion writes me that this species is rather closely allied to *durangoensis*, but is distinct.

22 **H. occidentalis** Champ.—Biol. Cent.-Amer., Coleopt., IV, Pt. i, p. 425.—Rather elongate, parallel, moderately convex, dull and alutaceous, castaneous, the legs and under surface rather paler, rufescent; pubescence short, rather fine, moderately dense, not at all conspicuous. *Head* finely, densely punctate anteriorly, more coarsely and slightly more sparsely so between the eyes, which are large, separated by one-third their width in the male and one-half in the female; antennæ about two-fifths as long as the body, subfiliform, moderately stout, the joints about twice as long as wide, third slightly longer than the fourth. *Prothorax* one third (male) to one-half (female) wider than long, the apex broadly, rather feebly arcuate, three-fourths as wide as the base, not continuous in curvature with the sides, the latter parallel and nearly straight in basal half, thence moderately convergent and arcuate to the apex; basal angles right, slightly blunt; base posteriorly oblique toward the basal angles, broadly, feebly arcuate in middle half; disk scarcely impressed, rather coarsely, very densely punctate, the punctures almost in contact but circular and not polygonally crowded. *Elytra* three and one-half times as long as the prothorax and very slightly wider, gradually, obtusely ogival toward apex; sides thence parallel and nearly straight to the humeri, which are obliquely, broadly rounded externally to the prothorax; disk with rather broadly, feebly impressed series of small, close-set punctures, the intervals finely, confusedly and moderately closely punctured. *Abdomen* polished, finely, sparsely punctured, a little more closely so along the middle in the male. *Legs* decidedly robust, the basal joint of the hind tarsi much longer than the remainder. Length 10.0–11.0 mm.; width 3.3–3.8 mm.

Texas.

The fourth joint of the maxillary palpi is strongly dilated, with the apex much longer than either side, and, in outline, is nearly as in *Lobopoda*.

The large size and elongate-parallel form will readily serve to differentiate this species from any other within our faunal limits, being approached in these respects only by *prolixus*.



23 **H. dorsalis** Schz.—Proc. Am. Phil. Soc., XVII, p. 370.—Oblong-oval, rather strongly depressed, dark rufo-ferruginous, the elytra black in apical two-thirds; abdomen, legs and antennæ paler; surface moderately shining, feebly alutaceous; pubescence short, rather fine and sparse, pale but not conspicuous. *Head* rather sparsely, coarsely punctate, the eyes large, somewhat narrowly rounded within, separated in both sexes by one-third to one-fourth their own width; antennæ long, slender, filiform, fully three-fifths as long as the body in the male, joints almost parallel, much more than twice as long as wide, third much shorter than the fourth in the male, subequal in the female. *Prothorax* three-fifths wider than long, the apex strongly arcuate and continuous with the sides, the latter broadly arcuate toward the base, which is transverse, with the sinuations small and feeble; angles right in the male, somewhat obtuse in the female, not rounded; disk widest at about basal third, coarsely and rather sparsely punctate, feebly deplanate toward the basal angles in the female, very obsoletely impressed in the middle toward base. *Elytra* a little more than three times as long as the prothorax and very slightly wider, gradually ogival at apex; sides parallel and almost straight in basal three-fifths, the humeri slightly exposed; disk with feebly impressed series of exceedingly fine, scarcely distinguishable, not very close-set punctures, the intervals finely, sparsely punctate, the punctures not distinctly finer than those of the striæ. *Abdomen* finely but distinctly, rather sparsely punctate. *Legs* slender, the basal joint of the hind tarsi fully one-third longer than the remainder. Length 5.7 mm.; width 2.2–2.3 mm.

Florida (Tampa and Capron). Mr. Schwarz.

A widely isolated species, not only in coloration but in its long filiform male antennæ, large eyes and peculiarly small inconspicuous serial punctures. The male antennæ, with the third joint shorter than the fourth, differ from those of any other species belonging to the present group which I have seen. In the female the antennæ are shorter and stouter.

The fifth segment in the male is much shorter and more obtusely rounded than in the female, and, in both sexes, the lateral subapical emarginations of this segment are unusually strong. The sexual difference in the eyes is not marked; in fact in the single female before me they are, if anything, more narrowly separated than in the male.

The fourth joint of the maxillary palpi is very broad, the apex a little longer than either side, and the angle at the base slightly more than right.

24 **H. discretus** n. sp.—Oblong, subparallel, moderately convex, piceous-black; under surface, legs and antennæ slightly paler, dark rufo-ferruginous, the abdomen distinctly paler toward apex; pronotum alutaceous, the elytra polished; pubescence rather long, semi-erect, somewhat coarse, pale

and sparse. *Head* rather strongly, sparsely punctate, the eyes large, separated by two-fifths their width; antennæ stout, two-fifths as long as the body, feebly attenuate toward apex, joints four to eleven very slightly increasing in length, the sixth joint on the compressed side fully one-half longer than wide, obconical, the tenth twice as long as wide, third and fourth equal in length. *Prothorax* three-fourths wider than long, the apex broadly arcuate and continuous with the sides, the latter broadly, feebly arcuate and convergent anteriorly, more strongly arcuate toward the basal angles, which are slightly obtuse but scarcely noticeably blunt; base transverse, the median lobe small and short, rounded; disk quite distinctly wider at basal third than at base, scarcely at all impressed, broadly explanate laterally toward the basal angles and narrowly, feebly reflexed along the sides in their vicinity, coarsely, strongly punctate throughout, the punctures circular and generally separated by nearly their own diameters. *Elytra* equal in width to the prothorax and about three and one-half times as long, gradually, rather acutely ogival at apex; sides parallel and nearly straight in basal two-thirds; disk with feebly impressed series of rather small but distinct punctures, the intervals finely, rather sparsely, confusedly punctured. *Abdomen* finely but rather strongly, sparsely punctured, almost totally impunctate toward apex; metasternum rather coarsely, sparsely punctate externally, rapidly very finely, densely so toward the middle; prosternum densely punctured. *Legs* rather long, the femora robust; basal joint of the hind tarsi two-fifths longer than the remainder. Length 6.2-7.4 mm.; width 2.4-3.1 mm.

Massachusetts; New York.

The general form throughout recalls that of *fusicornis*, and, as in that species, the antennæ are notably robust, at least in the female, and attenuated, but here the resemblance altogether ceases. In pronotal punctuation the two species stand almost at the extremes of the genus in regard to the magnitude of the punctures, and the basal joint of the hind tarsi is conspicuously longer in *discretus*.

The description is taken from the female. The male is smaller, with entirely polished upper surface, the eyes separated by about one-fourth of their width, and the antennæ more slender and much longer, being a little more than one-half as long as the body. The pubescence, also, seems to be a little longer, and the elytral punctuation is decidedly sparser; the pronotum is not so decidedly explanate toward the basal angles.

In both sexes the fourth joint of the maxillary palpi is rather strongly dilated, triangular, with the apex a little longer than the outer side. The fifth elytral stria is more strongly impressed toward base.

25 **H. convexus** n. sp.—Elliptical, strongly convex, black above, the under surface piceous-black; legs and antennæ throughout dark rufo-ferrugi-

nous; pubescence short, rather coarse, pale but sparse and not very conspicuous. *Head* rather strongly but sparsely punctured between the eyes, the latter large and separated by about one-half their width in both sexes; antennæ long and filiform, one-half as long as the body, the joints extremely feebly obconical, twice as long as wide, the third scarcely perceptibly longer than the fourth. *Prothorax* fully one-half wider than long, the apex distinctly, broadly arcuate, scarcely more than one-half as wide as the base, not continuous in curvature with the sides, the apical angles being very obtuse and rounded; base transverse, the narrow sinuation at each side of the middle rather strong; sides more or less convergent from the basal angles, sometimes parallel in basal half, nearly straight, broadly rounded anteriorly; basal angles right, not rounded; disk very feebly impressed in the middle toward base, coarsely, deeply, moderately densely punctured, the punctures generally very narrowly separated, the interstices feebly alutaceous, the middle toward base and region of the basal foveæ generally more or less impunctate. *Elytra* a little less than three times as long as the prothorax, and, at the middle, scarcely one-fourth wider, the apex gradually acute; sides arcuate and nearly continuous with those of the prothorax; disk coarsely, deeply striate, the striæ coarsely, deeply and approximately punctate, the intervals moderately convex, highly polished, rather finely, sparsely punctured. Under surface finely, sparsely punctate, the prosternum densely so, the propleuræ very sparsely throughout. *Legs* rather long, the basal joint of the hind tarsi slightly longer than the remainder. Length 6.8–7.5 mm.; width 2.8–3.2 mm.

Florida (Key West); Texas. Mr. Jülich.

A remarkably distinct species, apparently inhabiting the same regions as *densus*; in outline somewhat similar to that species but much larger, more shining, more coarsely, sparsely punctate and pubescent, and with very much longer antennæ. The eyes in the ample series before me, do not vary measurably in the interval separating them, which is much less than in *densus*.

26 **H. densus** Lec.—N. Spec. Col., 1866, p. 138.—Elongate-elliptical, rather strongly convex, generally dark rufo-ferruginous, with the elytra, abdomen and antennæ, except toward base, piceous-black; anterior parts generally dull, the elytra more shining; pubescence short, coarse, pale, dense and conspicuous. *Head* moderate, the interocular surface rather coarsely and somewhat sparsely punctured; eyes large and convex, separated in both sexes by about two-thirds their width; antennæ stout, one-third as long as the body, joints four to ten very strongly obconical, slightly longer than wide, more serrate internally than externally, third slender, slightly longer than the fourth. *Prothorax* scarcely one-half wider than long, the apex rather strongly arcuate and continuous in curvature with the sides, the latter becoming less arcuate and very feebly divergent toward the basal angles, which are right and not at all rounded; base transverse, narrowly and rather strongly sinuate on each side of the short truncate median lobe; disk almost unimpressed

throughout, rather coarsely, deeply punctate, the punctures round, perforate and generally very narrowly separated, the interstices dull, a narrow imperfect median line sometimes impunctate toward base. *Elytra* three times as long as the prothorax, and, at the middle, from one-third to one-half wider, gradually, rather acutely ogival at apex, the sides arcuate and continuous with those of the prothorax; disk finely, very densely punctate, with feebly impressed striæ of slightly larger, approximate punctures. Under surface polished, finely, sparsely punctate, the prosternum more densely, coarsely so but not dull. *Legs* moderate, the posterior tarsi rather robust, with the basal joint a little shorter than the remainder. Length 5.0–6.0 mm.; width 2.0–2.4 mm.

Florida; Texas; Ohio.

The color is frequently piceous-black throughout above, the legs always remaining pale. The eyes in sixteen of the seventeen specimens before me are perfectly uniform, and separated by two-thirds of their own width, but in the remaining specimen, which apparently does not differ in any other particular, they are smaller and separated by their full width; this specimen singularly enough is a male, and must be regarded as an accidental aberration.

A few specimens in the cabinet of Mr. Jülich are labeled Ohio, and are said to have been collected by Mr. Dury.

27 **H. ruficollis** Champ.—Biol. Cent.-Amer., Coleopt., IV, Pt. i, p. 438. —Elongate-oval, moderately convex, dull; elytra and abdomen blackish, remainder dark rufo-ferruginous; antennæ and legs concolorous; pubescence rather short and coarse, very dense, pale, and, on the elytra, rather conspicuous. *Head* moderate, rather strongly, very densely punctate and dull; eyes small, separated by distinctly more than their width; antennæ moderately stout, nearly two-fifths as long as the body, intermediate joints nearly one-half longer than wide, third and fourth subequal. *Prothorax* one-half wider than long; apex broadly, distinctly arcuate, about three-fourths as wide as the base, the latter transverse, the sinuations narrow and feeble; sides broadly arcuate, usually more or less parallel from the basal angles and then more strongly rounded into the apex; basal angles right, not rounded; disk not at all impressed, rather strongly, excessively densely punctured and completely dull, the basal foveæ obsolete. *Elytra* three times as long as the prothorax, and, at the middle, nearly one-third wider, rather gradually and acutely ogival at apex; sides feebly arcuate, generally continuous with those of the prothorax; disk finely, rather feebly, very densely punctate, the interstices very minutely, strongly granulato-reticulate and alutaceous, the striæ extremely fine, feebly impressed and very finely, inconspicuously punctured. Under surface punctured nearly as in *punctatissimus*. Posterior tarsi very short, the basal joint much shorter than the remainder. Length 4.7–5.8 mm.; width 2.0–2.2 mm.



## Arizona. Mr. Morrison.

A small, densely punctate and unusually dull form, rather closely allied to *densus* and perfectly similar to the latter in the peculiar coloration of the body, but differing in its much finer, still denser punctuation, smaller eyes, and in its decidedly more depressed form.

28 **H. dissensus** n. sp.—Oval, moderately robust, rather convex, castaneous; legs and antennæ pale, flavo-testaceous; lustre somewhat alutaceous, the elytra more strongly shining, pubescence moderate in length and density, pale. *Head* densely, rather finely punctate, the punctures generally in mutual contact; eyes small, separated by nearly one-third more than their own width; antennæ moderately stout, filiform, two-fifths as long as the body, the joints feebly obconical and about one-half longer than wide, third slightly longer than the fourth. *Prothorax* rather elongate, scarcely more than two-fifths wider than long, the apex broadly arcuate and almost continuous with the sides, the latter broadly rounded anteriorly, very feebly arcuate and parallel toward base, the basal angles slightly obtuse and very slightly rounded; base transverse, the sinuations just perceptible; disk evenly convex, rather coarsely, very deeply punctate, the punctures round, separated by rather less than their own widths, the bottom of each highly polished, the interspaces strongly alutaceous and granulato-reticulate. *Elytra* scarcely two and one-half times as long as the prothorax, and, at the middle, but slightly wider; apex somewhat gradually acute; sides broadly arcuate, nearly continuous with those of the prothorax; disk with moderately impressed series of very coarse, deep, perforate and approximate punctures, the intervals nearly flat, from three to four times as wide as the stria punctures, minutely, feebly, confusedly and somewhat closely punctured. *Abdomen* rather sparsely but unusually strongly punctured; anterior parts of the body coarsely so. *Legs* unusually short and robust. Length 4.4–4.8 mm.; width 1.9–2.1 mm.

## Texas (Galveston).

A distinct species, easily recognizable by its small size, oval, convex form, coarse punctuation especially of the elytral series, and rather long prothorax. It does not appear to be especially related to any of the Mexican species of the *Biologia*, but belongs near *densus*.

29 **H. seriatus** n. sp.—Oblong-ovate, slightly wider behind, moderately convex, dark piceo-castaneous, the pronotum and elytral suture sometimes feebly rufescent; under surface and legs paler, rufous; pubescence moderate in length, rather coarse and sparse. *Head* moderately convex, rather finely but deeply punctate, the punctures between the eyes separated by about their own diameters, the eyes moderate, separated by very nearly their own width in both sexes; antennæ long, slender and filiform, three-fifths as long as the body, joints four to eleven subequal, feebly obconical, the intermediate rather more than twice as long as wide, the third three times as long as wide and distinctly longer than the fourth. *Prothorax* rather small, two-thirds wider

than long, the apex broadly, rather strongly arcuate, the apical angles broadly rounded, the sides gradually more feebly divergent toward base and becoming nearly parallel in basal third, the angles right, not rounded; base transverse, the sinuations broad and very feeble; disk hardly at all impressed, somewhat coarsely, deeply punctate, the punctures round and generally separated by nearly one-half their own diameters, the interspaces shining. *Elytra* distinctly more than three times as long as the prothorax, and, behind the middle, one-third wider, rather abruptly and obtusely ogival at apex, the sides rather strongly arcuate behind, almost continuous with those of the prothorax, with distinctly impressed series of coarse close-set perforate punctures, the intervals polished, nearly flat, finely and sparsely punctate. *Abdomen* finely, very sparsely but rather strongly punctate, the prosternum densely so, the propleuræ very sparsely. *Legs* slender, the basal joint of the hind tarsi equal in length to the remainder. Length 5.5 mm.; width 2.4–2.6 mm.

#### Arizona.

The peculiar form of this species—distinctly widest behind,—together with the long antennæ and coarsely perforate elytral striæ, will readily serve to distinguish it. It belongs near *densus*, and has the coarse punctuation of the pronotum characterizing that and some allied species, but the form is here rather less convex; it is also allied to the Mexican *pallidus* Champ., but is darker in color, and has the pronotal punctuation less dense and not rugulose.

Five specimens, which are extremely uniform among themselves in size and outline; some are entirely pale testaceous from immaturity.

30 **H. testaceus** n. sp.—Elliptical, rather strongly convex, pale rufo-testaceous throughout, strongly shining; pubescence moderate in length, pale but sparse and not conspicuous. *Head* rather coarsely, deeply and sparsely punctate; eyes large, separated by one-half their width in the male and two-thirds in the female; antennæ rather slender and filiform, two-fifths as long as the body, the joints moderately obconical, the intermediate about twice as long as wide, third and fourth equal. *Prothorax* nearly three-fourths wider than long, the apex narrowly, strongly arcuate and continuous with the sides, which are strongly oblique and feebly arcuate anteriorly, more strongly arcuate in basal two-fifths, becoming very feebly convergent toward the basal angles, the latter right and slightly blunt; base transverse, the median lobe small, short, rounded; disk scarcely at all impressed, coarsely, deeply, rather sparsely punctate, the punctures generally separated by nearly their own diameters, the interspaces highly polished. *Elytra* but slightly more than three times as long as the prothorax, and, at the middle, very slightly wider, gradually, rather acutely ogival in apical two-fifths, the sides parallel and feebly arcuate, the two bases exactly equal; disk with fine but distinctly impressed series of fine but deep and distinct punctures, which are noticeably linear, the intervals feebly convex, polished, finely but distinctly, sparsely punctate. *Abdomen*

minutely, feebly, sparsely punctate. *Legs* rather slender, the femora moderately robust; basal joint of the hind tarsi slender, at least one-third longer than the remainder. Length 6.0 mm.; width 2.6–2.8 mm.

Arizona.

This distinct species is somewhat similar to *helvinus* in outline, and in its pale color and rather more than ordinarily deflexed pronotum, which gives it a relatively strong longitudinal convexity. It differs conspicuously from *helvinus* in its very coarse, sparse pronotal punctuation, smaller eyes, much less robust femora and shorter, more slender antennæ. It is represented by four specimens.

31 **H. rotundicollis** n. sp.—Oblong-oval, rather strongly convex, piceous-black throughout, the legs and antennæ but slightly paler, rufescent, rather strongly shining, the pubescence moderately long and dense, very easily denuded. *Head* feebly convex, finely and somewhat densely punctate, the punctures distinctly separated; eyes moderate, separated by about their own width; antennæ moderately stout, filiform, scarcely one-half as long as the body, the joints distinctly obconical, twice as long as wide, the third and fourth equal. *Prothorax* large, three-fifths wider than long, the apex very strongly, rather narrowly arcuate and continuous with the sides, the latter parallel and nearly straight in a little more than basal third; base transverse, the median lobe short, broadly rounded, distinct; basal angles right and slightly blunt; disk feebly explanate near the sides toward base, more especially in the female, not distinctly impressed, rather finely but strongly, somewhat sparsely punctate, the punctures separated by scarcely their own widths, the interspaces strongly shining. *Elytra* rather distinctly more than three times as long as the prothorax, gradually ogival in apical two-fifths; sides parallel and straight in basal three-fifths; disk scarcely equal in width to the prothorax, with feebly impressed series of small but deep, brevilinear, not very close-set punctures, the intervals minutely, confusedly and moderately closely punctured. *Abdomen* finely, very feebly and sparsely punctate. *Legs* rather slender. Length 5.6–6.4 mm.; width 2.1–2.6 mm.

Arizona.

In the four specimens before me there is not one entire posterior tarsus, but the basal joint is slender and appears to be slightly longer than the remainder.

The fourth joint of the maxillary palpi is strongly dilated, as much so as in *Lobopoda*, the angle at the point of support being distinctly obtuse, and the apex much longer than either side and rather widely open and spongiöse throughout its extent.

The strongly arcuate apex of the prothorax, rather sparse punctuation of the pronotum and palpal structure, will readily serve to identify this distinct species. The Central American *emmenasto-*

*ides* is somewhat allied, but differs in its much more oval form and smaller prothorax.

32 **H. inquilinus** n. sp.—Oblong-oval, moderately convex, rufo-testaceous, the elytra still paler and more flavate; upper surface polished, the pronotum feebly alutaceous; pubescence rather sparse, semi-erect, coarse, flavate in color. *Head* decidedly large, strongly, longitudinally convex, minutely, excessively sparsely punctate, the epistoma abruptly flat and more closely but still sparsely punctate; eyes small, separated by distinctly more than their own width; antennæ stout, cylindrical, nearly one-half as long as the body, distinctly attenuate, the joints obconical, third and fourth equal. *Prothorax* short, twice as wide as long, the apex subtruncate, just visibly arcuate, three-fourths as wide as the base, the latter broadly arcuate in the middle, the lobe extending posteriorly fully as far as the angles; sinuations extremely feeble; basal angles right; sides broadly arcuate throughout, a little more convergent anteriorly; disk slightly wider behind the middle than at base, feebly explanate near the sides toward base, not distinctly impressed or foveate, very finely, densely punctate, the punctures distinctly separated. *Elytra* fully three times as long as the prothorax, and, throughout, slightly narrower than the disk of the latter, distinctly dehiscent in apical third, the two bases exactly equal; sides parallel and nearly straight, the apex somewhat obtusely ogival; disk rather finely, moderately closely punctate, without trace of impressed lines except the sutural, which is very feeble, without trace of punctured series except extremely indefinitely toward base. *Abdomen* finely, moderately closely punctate, the fifth segment almost completely impunctate. *Legs* short and very robust, the tarsi short; basal joint of the posterior as long as the remainder. Length 4.5 mm.; width 1.8 mm.

California.

The single specimen before me is a male, and differs so greatly from the usual forms in general appearance, that for a long time I thought that it would have to be considered the type of a distinct genus; but, on close examination, no character of any kind can be discerned by which to distinguish it from *Hymenorus*.

The maxillary palpi are of the usual form, and the lateral subapical emarginations of the fifth ventral segment are deep and distinct. The claws are rather short and stout and finely, closely pectinate nearly throughout the length. This species is said to be myrmecophilous.

33 **H. fusicornis** n. sp.—Oblong, parallel, rather robust and feebly convex, piceous above, the elytra black; under surface and antennæ dark piceo-castaneous, the legs paler and more flavate; lustre rather shining, the pubescence somewhat dark, fine and sparse, rather long, subrecumbent. *Head* rather large and convex, the epistoma abruptly flat, very finely, sparsely punctate throughout; eyes moderate, separated by their own width; antennæ



exceedingly robust, compressed, rapidly and finely attenuate toward apex, two-fifths as long as the body, joints four to eleven gradually increasing in length, six and seven on the compressed side but very slightly longer than wide, the tenth three-fourths longer than wide, the third quite distinctly longer than the fourth. *Prothorax* three-fourths wider than long, the apex broadly, moderately arcuate, three-fourths as wide as the base, the latter broadly, strongly arcuate or feebly lobed in the middle, transverse toward the basal angles, which are slightly obtuse but not distinctly rounded; sides broadly, evenly arcuate throughout; disk slightly widest at basal third, very feebly impressed in the middle near the base, very finely and rather sparsely punctate. *Elytra* but little more than three times as long as the prothorax and equal in width to the disk of the latter, rather abruptly but acutely ogival in apical third; sides parallel and straight; disk with very feebly impressed series of unusually fine and feeble punctures, the intervals still more minutely and sparsely punctate. *Abdomen* finely and unusually densely punctate, the apices of the segments narrowly impunctate, metasternum a little more coarsely and sparsely so. *Legs* moderate, normal, the basal joint of the hind tarsi but slightly longer than the remainder. Length 6.8 mm.; width 2.8 mm.

California (southern).

A remarkably isolated species, to be readily identified by its smooth, rather shining, minutely, sparsely punctate surface and robust, compressed and rapidly finely attenuate antennæ; the pronotum is unusually deplanate along the base to the basal angles, but strongly declivous thence anteriorly along the sides.

I have seen but a single specimen which is a female. The so-called sixth segment is about one-fifth as wide as the fifth, truncate at apex, with the angles rounded.

This species appears to approach the genus *Menœceus*, but the posterior angles of the prothorax do not exhibit the slightest tendency to prolongation backward.

34 **H. nitidipennis** n. sp.—Oblong-elongate, parallel, subdepressed, dark piceo-castaneous above, the under surface, legs and antennæ pale rufotestaceous; elytral suture narrowly rufescent; prothorax rather dull, the elytra strongly shining; pubescence very short, rather sparse, inconspicuous. *Head* rather coarsely punctate, sparsely so between the eyes, the latter moderate in size, separated by nearly three-fourths of their width; antennæ long, somewhat stout, fully one-half as long as the body, the joints gradually narrower and shorter toward apex, the intermediate extremely feebly obconical and distinctly more than twice as long as wide, the third and fourth equal. *Prothorax* a little more than one-half wider than long, the apex rather strongly arcuate and continuous with the sides, which are broadly arcuate anteriorly, becoming nearly parallel and straight only very near the base, the basal angles right, not rounded; base transverse, the sinuations rather broad, moderately

distinct; disk scarcely impressed, somewhat coarsely, very densely punctate, the punctures circular and almost absolutely in contact, but not polygonally crowded. *Elytra* three and one-half times as long as the prothorax and about one-fifth wider, rather obtusely ogival in apical third, the humeri very slightly rounded to the base of the prothorax; sides parallel and nearly straight in basal two-thirds; disk with rather deeply impressed striæ of somewhat coarse, close-set, almost perforate punctures, the intervals somewhat convex, very minutely, rather sparsely punctured. *Abdomen* finely, sparsely punctate. *Legs* slender, the basal joint of the hind tarsi distinctly longer than the remainder. Length 6.8 mm.; width 2.3 mm.

#### Arizona.

This species is not at all closely related to any other, the strongly shining, deeply striate, minutely punctate elytra, coarsely, densely punctate pronotum, long antennæ and oblong, subdepressed form, at once distinguishing it.

35 *H. inæqualis* n. sp.—Oblong, parallel, strongly convex, the elytra polished, dark piceo-castaneous, the under surface, legs and antennæ paler, rufescent; pubescence rather long, more than usually erect, not very dense. *Head* coarsely, sparsely punctate between the eyes, more finely, densely so anteriorly; eyes moderate, separated by four-fifths of their width; antennæ rather stout, gradually, distinctly attenuate, fully two-fifths as long as the body, joints five to eleven gradually decreasing in width and just visibly increasing in length, the former two-thirds longer than wide, strongly obconical, the tenth much more than twice as long as wide, third very distinctly longer than the fourth. *Prothorax* short, three-fourths wider than long, the apex two-thirds as wide as the base, almost transversely truncate, the base transverse, the median portion broadly, distinctly arcuate; sides broadly arcuate and strongly convergent anteriorly, very slightly convergent and nearly straight in basal two-fifths, the angles rather distinctly obtuse but not at all rounded; disk not impressed, convex, very coarsely, extremely densely and not very deeply punctate, the punctures in contact and somewhat polygonally crowded. *Elytra* nearly four times as long as the prothorax and just perceptibly wider, the apex gradually, evenly ogival, the humeri feebly, obliquely rounded externally to the prothoracic base, the sides parallel and nearly straight; disk with extremely feebly impressed series of small but deep, close-set and almost perforate punctures, which are slightly oblong; intervals highly polished, minutely, sparsely punctate. *Abdomen* minutely, sparsely punctate, the anterior portions of the body coarsely so, the prosternum and propleuræ extremely densely so. *Legs* moderate in length, rather densely pubescent, the femora slightly robust; basal joint of the hind tarsi subequal in length to the remainder. Length 7.0 mm.; width 2.8 mm.

#### Arizona.

A distinct and comparatively isolated species, distinguishable by its oblong, unusually convex form, very coarse, dense pronotal and

minute, sparse elytral punctuation and rather long, unusually erect and fulvous pubescence, the latter being quite conspicuous although rather sparse on the elytra. The unique type is a female.

36 **H. tenellus** n. sp.—Slender, subparallel, rather convex, dark rufotestaceous throughout, the abdomen becoming slightly piceous toward the sides and apex; anterior parts rather dull, the elytra shining; pubescence short, coarse, pale fulvous, moderately dense and distinct. *Head* rather coarsely, very densely punctate and dull, the eyes rather large, separated by about three-fourths their width; antennæ somewhat slender, two-fifths as long as the body, the joints feebly obconical and about three-fourths longer than wide, third slightly longer than the fourth. *Prothorax* one-half wider than long, the apex broadly arcuate; base transverse, the sinuations rather wide and distinct, the median lobe rounded; sides parallel and nearly straight in basal half, then broadly rounded to the apex; basal angles slightly obtuse but scarcely at all rounded; disk broadly, very feebly impressed in the middle toward base, rather coarsely, deeply punctate, the punctures distinctly separated toward the middle, rather finer and densely crowded toward the sides. *Elytra* nearly three times as long as the prothorax, and, throughout, scarcely perceptibly wider, the sides parallel and straight to apical third, the apex ogival; disk finely, rather sparsely punctured, with series of very fine inconspicuous punctures, the series rather distinctly impressed near the suture but becoming almost completely unimpressed laterally. Under surface very finely, sparsely punctured, the prosternum and propleuræ finely, extremely densely so but not dull. Length 4.8–5.0 mm.; width 1.8 mm.

Florida (Crescent City). Mr. Schwarz.

A small subparallel species, somewhat related to *densus*, but differing greatly in form, structure of the antennæ, coloration and elytral punctuation. I have seen three specimens, which do not display any variation sexual or otherwise.

37 **H. sobrinus** n. sp.—Oblong-oval, convex, shining, black throughout above and beneath; legs black, the femora slightly rufescent toward base; antennæ fuscous; pubescence moderately long, not extremely dense and not very conspicuous. *Head* between the eyes rather coarsely, deeply punctate, the punctures slightly separated; eyes moderate, separated by fully their own width; antennæ rather slender, two-fifths as long as the body, the intermediate joints very feebly obconical and nearly twice as long as wide, third and fourth mutually similar, slender, cylindrical, the former slightly the longer. *Prothorax* short, fully four-fifths wider than long, the apex broadly, feebly arcuate, two-thirds as wide as the base, the latter transverse, with the sinuations broad and feeble but distinct; basal angles slightly obtuse but not distinctly blunt; sides parallel and feebly arcuate in basal half, then convergent and scarcely more strongly arcuate to the apex; disk rather strongly punctate, the punctures all slightly separated, the interstices polished; basal foveæ very feeble. *Elytra* rather more than three times as long as the prothorax and nearly one-

fourth wider, sides parallel and nearly straight in basal two-thirds, the apex broadly ogival; humeri narrowly rounded to the base of the prothorax; disk finely, sparsely punctate, with rather coarsely impressed series of punctures, which are small and inconspicuous when viewed by lateral light, but rather coarse by light reflected along the striæ from the front. Under surface polished, minutely, sparsely punctate, the prosternum very densely so but not dull. *Legs* moderate. Length 4.8 mm.; width 2.0 mm.

Florida.

This species belongs somewhat near *tenellus*, but differs greatly in coloration, in its broader form, and especially in its wider elytra and more transverse prothorax; the eyes in the unique female are decidedly smaller, and the antennæ still more slender.

38 **H. floridanus** n. sp.—Oblong-oval, rather strongly convex, dark piceous-brown throughout, the legs and antennæ throughout pale rufo-ferruginous; pubescence short, rather fine, sparse, pale but not very conspicuous. *Head* rather short, strongly and rather densely punctured between the eyes, the latter moderately large, separated by about four-fifths of their own width; antennæ slender, two-fifths as long as the body, the joints nearly parallel, each distinctly more than twice as long as wide, the third a little longer than the fourth. *Prothorax* rather short, three-fourths wider than long, the apex broadly arcuate, three-fourths as wide as the base, the latter broadly feebly sinuate at each side of the middle; sides feebly convergent and broadly arcuate from the basal angles, the latter right, not rounded; disk just visibly and broadly impressed or flattened in the middle, rather coarsely, very densely punctate, the punctures narrowly separated; interspaces rather shining. *Elytra* a little more than three times as long as the prothorax and nearly one-third wider; sides parallel and nearly straight; apex abruptly, obtusely ogival; humeri rather abruptly rounded to the base of the prothorax; disk somewhat coarsely, deeply striate, the striæ coarsely, rather closely punctate, the intervals finely but very distinctly, moderately closely punctured. Under surface finely, sparsely punctate, the prosternum very densely so, the propleuræ rather densely so and more coarsely rugulose. *Legs* moderate; basal joint of the hind tarsi quite distinctly longer than the remainder. Length 5.5–6.2 mm.; width 2.4–2.8 mm.

Florida. National Museum.

Rather closely allied to *sobrinus*, but differing in its paler coloration, larger size, slightly larger eyes, rather longer and more slender antennæ and more robust form. The prothorax is longer and the sides are much more convergent from the basal angles than in *sobrinus*; it is represented by two specimens.

39 **H. confertus** Lec.—N. Spec. Col., 1866, p. 136.—Oblong-oval, moderately robust, rather strongly convex, dark brown throughout, the legs slightly



paler and more ferruginous; integuments feebly shining, the pubescence short, dense, moderately conspicuous. *Head* small, finely, densely punctate, the eyes rather large, separated by two-thirds of their own width in the male; antennæ rather stout, a little more than one-third as long as the body, the joints moderately obconical, nearly one-half longer than wide, the third but slightly longer than the fourth. *Prothorax* nearly two-thirds wider than long, the apex broadly, rather strongly arcuate and almost continuous with the sides, the latter parallel and straight in basal half, then broadly, evenly rounded to the apex; base transverse, the sinuations rather distinct; angles right, not at all rounded; disk scarcely impressed, rather finely and extremely densely punctured throughout. *Elytra* three times as long as the prothorax and about one-fourth wider, rather abruptly ogival behind; sides in basal two-thirds parallel and nearly straight, the humeri rather abruptly but narrowly rounded to the base of the prothorax; disk with feebly impressed series of moderately coarse, close-set punctures, the intervals nearly flat, the punctures dense but not extremely so. *Abdomen* finely, rather sparsely punctured, the metasternum rather coarsely and unusually densely so, the prosternum extremely densely so. *Legs* slender, the basal joint of the hind tarsi distinctly shorter than the remainder. Length 5.3–6.0 mm.; width 2.1–2.4 mm.

Lower California (Cape San Lucas). Cab. LeConte.

In its oblong form, with the elytra rather short, parallel and slightly wider than the prothorax, this species is an analogue of *sobrinus* and *floridanus*, but it differs from both of the latter in its finer, much denser punctuation, more elongate prothorax and slightly shorter, more robust antennæ.

40 **H. fuscus** n. sp.—Oblong, rather elongate and convex, dark brownish-piceous, the under surface and legs slightly paler, rufescent; integuments feebly shining, the pubescence very short, pale, dense and conspicuous. *Head* finely, densely punctate, the punctures rather distinctly separated between the eyes, the latter somewhat large, separated by fully three-fourths their width; antennæ rather more than one-third as long as the body, somewhat slender, the joints feebly obconical, nearly two-thirds longer than wide, the third slender, much longer than the fourth. *Prothorax* one-half wider than long; apex feebly arcuate, two-thirds as wide as the base, not at all continuous with the sides, the apical angles being distinctly evident although very obtuse; base transverse, the sinuations small and very feeble; basal angles a little more than right, not rounded; sides broadly arcuate and convergent anteriorly, feebly arcuate toward base; disk just visibly wider behind the middle than at base, scarcely at all impressed, rather finely, extremely densely punctate. *Elytra* fully three times as long as the prothorax and scarcely more than one-fifth wider; apex evenly ogival; humeri abruptly rounded to the base of the prothorax; sides parallel and nearly straight in basal two-thirds; disk with fine, feebly, but distinctly impressed series of rather approximate punctures, which are very fine externally but somewhat strong near the suture, the intervals finely, very densely, confusedly punctate. *Abdomen*

finely, sparsely punctate, otherwise nearly as in *confertus*, the metasternum a little more sparsely punctate. *Legs* slender; basal joint of the hind tarsi distinctly longer than the remainder. Length 5.8–6.6 mm.; width 2.3–2.6 mm.

California (Coronado Beach, San Diego Co.). Dr. Blaisdell.

This species is allied to *confertus*, but differs in its larger size, more elongate form, more slender antennæ and longer basal joint of the hind tarsi. The prothorax, especially, is longer and with the apex more transverse. I have not positively identified the sexes in the two individuals before me, but it is probable that the sexual difference in the eyes is not marked.

41 **H. macer** n. sp.—Oblong-oval, somewhat convex, rather shining, pale rufo-testaceous, sometimes slightly brownish, the legs more flavate; pubescence very short, dense, pale, moderately conspicuous. *Head* feebly convex, the interocular surface finely, rather sparsely punctate in the male, the eyes in that sex moderately large, separated by fully three-fourths of their width; antennæ stout, distinctly more than one-third as long as the body, very feebly attenuate, the intermediate joints short, scarcely one-fourth longer than wide, strongly obconical, the third more slender and scarcely perceptibly longer than the fourth. *Prothorax* about one-half wider than long, the apex two-thirds as wide as the base, feebly arcuate; sides broadly arcuate and convergent anteriorly, nearly parallel and very feebly arcuate toward base, the angles slightly obtuse; base transverse, the sinuations small and feeble; disk broadly, just visibly impressed in the middle toward base, rather finely, extremely densely punctate, the punctures in contact and sometimes slightly rugulose, the lustre however rather shining. *Elytra* fully three times as long as the prothorax and just visibly wider, the apex gradually ogival, the humeri narrowly exposed, rounded; sides parallel and almost straight in basal two-thirds; disk with very fine, feebly impressed striæ of fine, inconspicuous punctures, the intervals rather strongly shining, nearly flat, finely, extremely densely, confusedly punctate. Under surface finely, sparsely punctate, the prosternum and its side-pieces very densely so. *Legs* rather slender, the basal joint of the hind tarsi nearly as long as the remainder. Length 5.0–5.8 mm.; width 2.0–2.2 mm.

California (Poway, San Diego Co.; Folsom).

A rather inconspicuous, unusually pale species, somewhat distantly related to *deplanatus* and distinguishable by its much more convex form and slightly longer prothorax.

In *deplanatus* the punctures of the pronotum are small, circular and distinctly separated, while in the present species they are quite peculiar, giving under small magnifying power, the rugulose appearance mentioned in the description. The punctures in *macer* are much larger than in *deplanatus*, slightly elongate, closely crowded

and polygonal, much shallower and gradually evanescent toward their posterior extremities, with the bottom polished, the hair borne from a minute tuberculiform puncture adjoining the anterior margin of each.

Five specimens, two of which were sent me by Dr. Blaisdell, of San Diego.

42 **H. indutus** n. sp.—Oblong-elongate, parallel, rather strongly convex, dull, piceous in color, the legs and antennæ slightly paler and more ferruginous; pubescence short, extremely dense. *Head* feebly convex, the punctures between the eyes moderately fine and distinctly separated; eyes moderate, separated by a little more than three-fourths of their width; antennæ rather stout, not perceptibly attenuate, somewhat long, about two-fifths as long as the body, the intermediate joints strongly obconical, about one-third longer than wide, the third cylindrical and just visibly longer than the fourth. *Prothorax* slightly more than one-third wider than long, the apex broadly arcuate, nearly three-fourths as wide as the base, the latter transverse, the sinuations narrow but distinct; sides broadly rounded anteriorly, becoming nearly straight and parallel in basal half, the angles right, not at all rounded; disk convex, finely, deeply, very densely punctured, the punctures round and slightly separated toward the middle. *Elytra* three times as long as the prothorax and very slightly wider, rather obtusely ogival at apex, the humeri slightly rounded to the base of the prothorax; sides parallel and nearly straight in basal two-thirds; disk finely, extremely feebly striate, the striæ finely and inconspicuously punctured; intervals very finely and excessively densely punctate. *Abdomen* polished, minutely, rather sparsely punctured; prosternum and propleuræ rather coarsely, extremely densely so. *Legs* moderate, the basal joint of the hind tarsi slightly shorter than the remainder. Length 5.0–7.0 mm.; width 1.9–2.5 mm.

Texas (El Paso); New Mexico; Arizona.

The large amount of material before me is rather heterogeneous and apparently involves two or three very closely allied species. Some of the smallest forms are females, and two are labeled "Florida," but this is probably an erroneous locality.

The typical form is from El Paso, and has the punctuation of the pronotum as described above and the pubescence rather dark in color. Other specimens have the punctuation of this part slightly coarser, densely crowded, polygonal and more rugulose, the pubescence being a little longer, pale ochreous and much more conspicuous.

All the specimens agree, however, in the extremely dense punctuation of the elytra, which noticeably exceeds that of *deplanatus*, and is even apparently denser than in *macer*. The species is allied to

*macer*, but differs in its more elongate form, especially longer prothorax, larger size and darker color.

In some specimens, especially those with paler pubescence, there is scarcely a trace of the serial punctures.

43 **H. punctatissimus** Lec.—New Spec. Col., 1866, p. 138.—Oblong-oval, subparallel, somewhat depressed, pale brown and dull above, paler rufo-testaceous and polished beneath; legs and antennæ still paler, more flavate; pubescence extremely dense, short. *Head* feebly convex, rather finely, densely punctate, the punctures distinctly separated between the eyes, the latter moderately large, separated by three-fourths their width; antennæ stout, rather more than one-third as long as the body, the joints beyond the third just visibly longer than wide, strongly obconical, the third a little longer than the fourth. *Prothorax* one-half to two-thirds wider than long, the apex about two-thirds as wide as the base, more or less distinctly arcuate; base transverse, the sinuations almost obsolete; basal angles very slightly obtuse, not at all rounded; sides broadly rounded and convergent anteriorly, almost parallel and more nearly straight toward base; disk excessively finely, densely punctate and dull. *Elytra* about three times as long as the prothorax, and, at the middle, quite distinctly wider; humeri not exposed at base; apex rather acutely ogival; sides nearly straight in basal two-thirds; disk excessively densely, finely punctured, with fine, feebly impressed rows of slightly larger feeble and scarcely distinguishable punctures. *Abdomen* polished, finely, rather sparsely punctured, the metasternum somewhat coarsely and densely so, the prosternum and propleuræ extremely densely so and dull. *Legs* moderate in length, the basal joint of the hind tarsi as long as the remainder. Length 4.5–5.3 mm.; width 1.8–2.2 mm.

#### Arizona.

The fourth joint of the maxillary palpi is rather short and robust, the apex intermediate in length between the inner and outer sides.

A small species easily known by its excessively dense punctuation and pubescence, the latter being also very short and coarse.

44 **H. deplanatus** Champ.—Biol. Cent.-Amer., Coleopt., IV, Pt. i, p. 440.—Oblong, subparallel, rather strongly depressed, feebly shining, piceous-brown, the legs and antennæ slightly paler; pubescence coarse, very short, moderately dense. *Head* small, feebly convex, the punctures distinct, very sparse between the eyes, the latter somewhat large, separated by about two-thirds their width; antennæ stout, rather more than one-third as long as the body, the joints very strongly obconical, the intermediate nearly one-half longer than wide, third distinctly longer than the fourth. *Prothorax* fully one-half wider than long, the apex strongly arcuate and continuous in curvature with the sides, the latter becoming nearly straight and parallel in basal half; basal angles right, not rounded; base transverse, the sinuations narrow, somewhat distinct; disk rather finely, densely punctate, alutaceous, the punctures



not polygonally crowded; basal foveæ almost obsolete. *Elytra* rather more than three times as long as the prothorax, and, behind the middle, about one-third wider, somewhat abruptly and obtusely rounded behind; sides just visibly arcuate; disk rather distinctly shining, not very finely, deeply, densely punctate and with distinctly impressed series of slightly coarser, very approximate punctures. *Abdomen* very minutely, sparsely punctate, the prosternum rather densely so but strongly shining. Length 4.8–5.0 mm.; width 1.9 mm.

Arizona. Mr. Morrison.

This is a small species, somewhat allied to *punctatissimus*, but easily distinguishable by its sparser punctuation especially of the elytra, and the more distinctly punctate elytral striæ, also by its still more depressed form.

The two specimens before me appear to be females, as there is no trace of the peculiar sexual modification of the tibiæ mentioned by Mr. Champion.

45 **H. gemellus** n. sp.—Oblong-elongate, somewhat strongly depressed, parallel, dark brownish-piceous, the abdomen blackish, remainder of under surface, legs and antennæ paler, rufescent; integuments somewhat shining, the pubescence short, moderately dense. *Head* deeply punctured, the punctures rather small and well separated between the eyes, finer and denser anteriorly; eyes moderately large, separated by about two-thirds their width; antennæ moderately long and slightly stout, joints strongly obconical, nearly one-half longer than wide, third just visibly longer than the fourth. *Prothorax* rather more than one-half wider than long, the apex broadly, feebly arcuate, three-fourths as wide as the base, not continuous in curvature with the sides, the latter broadly arcuate anteriorly, parallel and nearly straight in basal half, the angles right; base transverse, the sinuations rather broad and distinct; disk not impressed, finely, extremely densely punctate throughout, the punctures round, not quite in contact, the very narrow interspaces shining. *Elytra* quite distinctly more than three times as long as the prothorax and just visibly wider, somewhat abruptly and obtusely ogival at apex, the humeri very narrowly exposed; sides parallel and nearly straight; disk somewhat finely and feebly striate, the striæ finely but distinctly, closely punctate; intervals finely, confusedly and moderately densely punctate, polished. *Abdomen* finely, very sparsely punctate. *Legs* normal, the basal joint of the hind tarsi equal in length to the remainder. Length 6.0–6.3 mm.; width 2.2–2.3 mm.

Arizona.

A somewhat inconspicuous species, more or less allied to several others but especially *deplanatus*. From the latter it is readily separable by its finer and rather sparser elytral punctuation and much larger size. The three specimens before me were formerly a part of the Levette cabinet.

46 **H. uniseriatus** n. sp.—Oblong-oval, rather narrow, convex, highly polished and pale flavo-testaceous throughout; pubescence somewhat long and semi-erect, coarse, pale and sparse. *Head* distinctly, evenly convex, coarsely, deeply, rather sparsely punctate; eyes small, separated by one-half more than their own width; antennæ moderately stout, a little less than one-half as long as the body, the joints rather strongly obconical and scarcely one-half longer than wide, the third scarcely as long as the fourth in the female. *Prothorax* about one-half wider than long, the apex three-fourths as wide as the base, feebly arcuate; sides parallel and almost straight in basal two-thirds, the apical angles broadly rounded; base transverse, the sinuations broad and rather distinct; basal angles right, distinctly, narrowly rounded; disk broadly, feebly impressed in the middle toward base, coarsely, rather sparsely punctate, the basal foveæ small but quite distinct. *Elytra* nearly four times as long as the prothorax and about one-half wider; sides parallel, broadly arcuate behind, the apex ogival; humeri rounded, rather broadly exposed; disk with series of rather coarse, deep, moderately approximate punctures, the series scarcely at all impressed except very feebly toward the suture; intervals each with a single even series of very fine punctures. *Abdomen* finely, sparsely punctate, the prosternum very densely so. *Legs* moderate, slender; basal joint of the hind tarsi slightly longer than the remainder. Length 5.0 mm.; width 1.9 mm.

California.

The unique specimen is a female and it is possible that in the male, the third antennal joint will prove to be quite distinctly shorter than the fourth.

This species is decidedly aberrant in the form of the prothorax, which is more subquadrate, in the smaller eyes and especially in the arrangement of the elytral punctures. I am however unable to perceive any structural characters, which would warrant its removal from the present genus. The maxillary palpi are of a common form, the fourth joint being almost evenly recti-triangular, with the oblique apex about equal in length to the outer side.

#### MENGECEUS Champ.

Assuming *M. crassicornis* Champ. as the type of this genus, its characters may be briefly stated as follows:—

Body oval, rather broad and moderately convex, the sides of the elytra continuous in curvature with those of the prothorax, the basal angles of the latter acute and slightly produced posteriorly. Head small, short, deeply inserted, vertical in repose, the fourth joint of the maxillary palpi very broad, the apex nearly one-half longer than the outer side; terminal joint of the labial short and robust. Antennæ stout, the intermediate joints dilated in

the male. Prosternal process horizontal, tumid posteriorly, then abruptly vertical and excavated to the level of the prosternal side-pieces. Legs and tarsi throughout as in *Hymenorus*.

The general form of the body approaches some of the species of *Cistela* or *Isomira*, but apart from the characters above mentioned the genus is very closely related to *Hymenorus*. Some of the species of the latter genus such as *inquilinus*, *fusicornis* and *porosicornis* are more or less allied to *Menœceus*, but the form is narrower, the prothorax less transverse, and the basal angles not posteriorly produced. This last feature constitutes really the only important difference between *Menœceus* and *Hymenorus*.

One species, which however differs from the typical form in having the prosternal process and antennæ as in *Hymenorus*, is described in the *Biologia* by Mr. Champion from southern Texas; I have seen no representative of it, but the original description is as follows:—

**M. texanus.**—"Ovate, rather broad, piceous-brown, dull, thickly pubescent. Head sparsely and rather coarsely punctured; eyes (♂) very large, narrowly separated; antennæ (♂) stout, rather short, ferruginous; prothorax very broad, the disk obsoletely canaliculate behind, the surface closely (but not densely), finely, and shallowly punctured; elytra finely punctate-striate, the interstices quite flat and finely and rather closely punctured; legs ferruginous; the lateral lobes of the last ventral segment broad and spoon-shaped and clothed with long hairs at the apex." Length  $7\frac{1}{4}$  mm.; width  $3\frac{1}{2}$  mm.

This species is stated to be much broader than *M. crassicornis*, with the pronotum more finely and sparsely punctured.

#### TELESICLES Champ.

This genus is very closely related to *Hymenorus*, the characters throughout being similar, with the exception of the form of the prothorax, the apex being transversely truncate and the sides convergent toward base and feebly sinuate; this form is however so radically different from anything known in *Hymenorus*, as to give quite a distinct and peculiar habitus to the species of *Telesicles*, and there can be but little doubt that the genus is a really valid one. It is simply a good illustration of the statement made in the introductory remarks to the present family, that generic differences often depend more upon general facies or appearance than upon any decided modification of special organs.

Our single species is as follows:—

**T. cordatus** Champ.—Biol. Cent.-Amer., Coleopt., IV, Pt. i, Nov. 1888, p. 451.—Oblong, rather depressed, polished and pale ochreous-testaceous throughout; pubescence rather short, semi-erect, coarse and sparse. *Head* feebly convex, rather strongly, not very densely punctate; eyes small, separated by nearly one-half more than their own width; antennæ slender, filiform, nearly one-half as long as the body, intermediate joints feebly obconical, about twice as long as wide, the third and fourth equal. *Prothorax* one-half wider than long, the apex transversely truncate, four-fifths as wide as the base, the latter transverse or just visibly, evenly arcuate throughout, the sinuations obsolete; sides broadly arcuate, convergent in basal third and becoming strongly sinuate just before the basal angles, the latter right, somewhat prominent, not at all blunt; disk evenly convex, not impressed, rather coarsely and sparsely punctate; basal foveæ broadly impressed and almost obsolete. *Elytra* about three times as long as the prothorax and one-fourth wider than the disk of the latter, abruptly, acutely ogival at apex; sides parallel and nearly straight; humeri narrowly rounded and quite broadly exposed at base; disk with extremely feebly impressed series of rather coarse deep punctures, which become much less distinct near the apex; intervals flat, finely, confusedly and very sparsely punctate. *Abdomen* finely but distinctly, sparsely punctate. *Legs* rather short, slender, the basal joint of the hind tarsi nearly as long as the remainder. Length 5.5–5.8 mm.; width 2.0–2.1 mm.

Texas (El Paso). Mr. Dunn.

There seems to be very little sexual difference, the eyes being just visibly less distant in the male, and the fifth segment a little more acutely rounded behind in that sex.

#### **MYCETOCHARA**<sup>1</sup> Berth.

Several attempts have been made to subdivide this genus but all more or less unsuccessfully, for, although easily divisible into groups by certain comparatively constant prosternal characters, it is found that each group contains species which, in general habitus, are strongly suggestive of homologous species in some of the others.

<sup>1</sup> The correct designation of this genus is involved in considerable uncertainty, and for this reason I at first determined to make use of the name given in the Munich Catalogue, quite forgetting the familiar fact that *Mycetophila* had been used by Meigen in 1803 for a genus of Diptera. The word here adopted is that proposed by Seidlitz in the most recent edition of the "Fauna Baltica," and is considered by that author to be two years earlier than *Mycetochares* Latr., the former having been printed in 1827, while the latter was not published in a properly latinized form until 1829.



In other words each group is so heterogeneous, and the interosculating lines of affinity between them so numerous, that it seems impossible to consider them as having full generic value.

The form and extent of the anterior coxæ and of the prosternal process which separates them, constitute the best characters for minor subdivisions, for these appear to be the most constant within the limits of the groups.

The fourth joint of the maxillary palpi is usually in the form of a right-angled triangle, with the right angle at the point of attachment, but sometimes the two sides form an angle which is slightly less than right, the apex becoming shorter; it is generally quite robust, but occasionally becomes decidedly slender. The eyes, tarsi and antennæ vary greatly in size and form in the various species, and appear to be but slightly affected by sex.

The sexual differences are stated to be quite pronounced in many of the European species, but in the North American they are certainly not remarkably so, and, as there is often much difficulty in determining the sex of individuals, but little attention has been given to this subject in the following descriptions.

The punctuation generally varies to a considerable degree, and sometimes appears to be coarse or rather fine in the same individual according to the direction of the reflected light; the elytra often have to be held, therefore, in a very oblique position with reference to the light, in order to see that the impressed lines, which are nearly always distinct, are not accompanied by series of punctures in such species as *fraterna* and *nigerrima*.

Our species may readily be separated into three groups as follows:

Anterior coxæ rather small, separated by a comparatively wide prosternal process, the latter longitudinally convex and attaining the level of their apices.....**I**

Anterior coxæ separated by a thin prosternal lamina.

The coxæ very large, conoidal and prominent, almost contiguous at apex, the prosternal lamina deeply placed between them, and generally more or less horizontal.....**II**

The coxæ rather small, the lamina longitudinally convex and attaining the level of their apices.....**III**

Groups I and II both contain species with and without the red humeral spots, and these groups are peculiar to the eastern parts of the continent. Group III contains no species as far as known with the humeral maculation, and is peculiar to the regions west of the

Rocky mountain divide. These groups are nearly, but probably not exactly, equivalent to those which have been indicated in the European fauna.

#### Group I.

Elytra with a more or less extended humeral spot of pale rufo-testaceous.

Elytra devoid of punctured series.

Eyes small.

Pubescence excessively short and sparse; form rather narrow and convex.....**haldemani**

Pubescence normal; form broader and more depressed; prothorax more transverse.....**fraterna**

Eyes very large; elytral lines strongly impressed but without distinct punctured series.....**megalops**

Elytra with distinct series of larger punctures.

Pronotum "hardly punctured".....**basillaris**

Pronotum distinctly, deeply punctured.

Form rather slender and depressed; head and prothorax small; elytra distinctly more than twice as long as wide.....**tenuis**

Form more convex; prothorax larger.

Elytra twice as long as wide; antennæ pale rufo-testaceous throughout.....**foveata**

Elytra scarcely more than two-thirds longer than wide; antennæ piceous-black, pale near the base; pubescence longer and more erect.....**gilvipes**

Elytra unicolorous throughout.

Elytra without punctured series; surface highly polished, deep black, very finely, sparsely punctured.....**nigerrima**

Elytra with distinct series of coarser punctures.

Prothorax much narrower than the elytra and but slightly wider than the head, sparsely punctate; eyes large.....**gracilis**

Prothorax scarcely narrower than the elytra, much wider than the head, coarsely and very densely cribrate; eyes small.....**rufipes**

#### Group II.

Elytra with a red humeral spot.

Pronotum narrowly, abruptly explanate at the sides.....**marginata**

Pronotum not explanate at the sides.

Eyes rather small, separated by twice their width; prothorax equal in width to the elytra.....**binotata**

Eyes large, separated by but slightly more than their width; prothorax narrower than the elytra.....**longula**

Elytra without humeral red spot.

Prothorax smooth, polished, extremely finely, sparsely punctured; elytral striæ very deeply impressed, almost sulciform; size large.....**bicolor**

Prothorax coarsely, rather densely punctured; elytral striæ moderately impressed.

Pronotum not explanate at the sides; under surface usually paler, with the two anal segments darker.....**analis**

Pronotum explanate laterally toward base; under surface pale brown, the apical segments not darker; elytral striæ more even ....**lugubris**

### Group III.

Sides of the prothorax parallel or feebly divergent toward base; hind tarsi very long and slender.

Eyes large; prothorax but slightly narrower than the elytra; hind tarsi with the basal joint as long as the remainder.....**longipennis**

Eyes small; prothorax equal in width to the elytra; basal joint of the hind tarsi as long as the remainder.....**pacifica**

Eyes moderate; head and prothorax very small; elytra long; hind tarsi with the basal joint much shorter than the remainder.....**procera**

Sides of the prothorax convergent toward base.

Posterior tarsi slender; elytral humeri narrowly exposed.

Elytra with punctured series .....**pubipennis**

Elytra without trace of punctured series; form much more robust, the prothorax strongly transverse.....**nevadensis**

Posterior tarsi very short and stout; humeri broadly exposed.

**crassulipes**



**M. haldemani** Lec.—N. Spec. Col., 1866, p. 140.—Oblong, subparallel, rather strongly convex, highly polished throughout, black; the under surface paler, rufo-testaceous; legs flavate; antennæ fuscous, flavo-testaceous toward base; each elytron with a large basal red spot extending obliquely from near the suture to the humerus; pubescence excessively minute, sparse, recumbent and entirely inconspicuous. *Head* feebly convex, very minutely, sparsely punctate; eyes small, not prominent, separated by four times their width; antennæ about one-third as long as the body, joints very feebly obconical, not narrower toward apex, about two-thirds longer than wide, the third and fourth equal. *Prothorax* about two-thirds wider than long; sides strongly rounded, convergent and straighter toward base; apex truncate, nearly three-fourths as wide as the base, the latter transverse, the sinuations broad and very feeble; basal angles slightly obtuse but not rounded; disk strongly convex throughout, narrowly impressed in the middle toward base, extremely minutely and sparsely punctate, the basal foveæ almost obsolete. *Elytra* three times as long as the prothorax and not wider, parallel, rather gradually and acutely rounded behind; disk very finely, sparsely punctate, without trace of series and without impressed lines, except vaguely, the two sutural being quite distinct by obliquely reflected light. Under surface throughout finely, very sparsely punctate. *Legs* slender, sparsely pubescent; basal joint of the hind tarsi nearly as long as the remainder. Length 3.8–4.5 mm.; width 1.4–1.6 mm.

New York; Georgia; Florida.

The sexual differences appear to be exceedingly feeble.

This species is one of the smallest of the genus, and may readily be known by its extremely sparse minute punctuation, almost invisible pubescence and absence of elytral series.

**M. fraterna** Say.—Journ. Ac. Phil., III, 1823, p. 270; *laticollis* Lec.: Pr. Am. Phil. Soc., XVII, p. 617.—Oblong-elongate, subparallel, moderately convex, piceous-black, the under surface, legs and antennæ slightly paler, piceous to rufo-ferruginous, each elytron with a large pale oblique spot from near the suture to the humerus, polished; pubescence fine, short, not very dense and not conspicuous. *Head* feebly convex, rather finely, sparsely and somewhat unevenly punctate; eyes moderate, separated by but slightly more than twice their width; antennæ nearly one-half as long as the body, moderately slender, the joints very feebly obconical, not distinctly narrower toward apex, the intermediate about three-fourths longer than wide, third fully as long as, or perhaps a little longer than, the fourth. *Prothorax* about three-fourths wider than long, the apex feebly arcuate, scarcely two-thirds as wide as the base, the latter transverse, the sinuations almost obsolete, the angles slightly obtuse, not rounded; sides broadly, very distinctly arcuate throughout; disk widest near basal third, somewhat finely, sparsely punctate, broadly impressed in the middle toward base, the basal foveæ very broadly impressed and indefinite. *Elytra* a little more than three times as long as the prothorax, scarcely visibly wider, rather gradually and acutely rounded behind; disk somewhat strongly, sparsely and unevenly punctate, devoid of series and without impressed lines, except more or less vaguely near the suture. Under surface very sparsely punctate. Length 3.9–6.0 mm.; width 1.4–2.3 mm.

Pennsylvania; New York; Canada.

The description refers to the male which appears to be much smaller and more slender than the female. In the latter sex the antennæ are relatively shorter and the prothorax is slightly more transverse. *Fraterna* is more northern in its distribution than *haldemani*.

I think that the unique specimen described by LeConte as *laticollis* is simply an extreme form of the female of this species. The punctuation, especially of the head, is very uneven and quite variable in *fraterna*, and there seemingly exists a most perplexing plasticity in the form of the prothorax in some species—see remarks under *tenuis*. In fact I have before me a normally punctate specimen of *fraterna*, in which the prothorax is somewhat dilated and rather wider than the elytra, just as in the type of *laticollis*.

Although Melsheimer states that his *ruficornis* is distinct from *fraterna*, I am inclined to think that it is nothing more than an



immature specimen of this species, or at most a slight variety. According to the description it is "brown, pubescent, densely punctulate; antennæ, labrum, palpi and feet testaceous; thorax at base each side of middle with a small and profound impression; dorsal impression obsolete; scutellum brown; elytra densely rugulose; toward the suture with faint traces of the interstices; base broadly and indeterminate testaceous; beneath pale brown; femora rather pale testaceous." The punctuation of *fraterna* is sometimes strongly rugulose, and, in regard to color, I have several specimens before me of *foveata*, the normal color of which is black with pale humeri, which have the elytra entirely pale from immaturity.

**M. megalops** n. sp.—Oblong-elongate, subparallel, rather depressed, polished, black, the under surface piceous-black; legs and antennæ slightly paler, piceous-brown, the latter paler toward base; pubescence moderate in length, dark, recumbent, sparse and inconspicuous. *Head* feebly, longitudinally convex, rather finely, densely punctate anteriorly, very sparsely and unevenly so between the eyes, the latter extremely large and convex, separated by about three-fourths their own width; antennæ robust, a little more than one-third as long as the body, apparently very feebly attenuate toward apex, the intermediate joints scarcely one-half longer than wide, third and fourth equal. *Prothorax* nearly four-fifths wider than long, the apex scarcely two-thirds as wide as the base, feebly arcuate; base transverse, the sinuations very feeble, the angles slightly obtuse but not rounded; sides broadly rounded and convergent anteriorly, less arcuate toward base; disk widest at about basal third, convex throughout, almost completely unimpressed, very finely and sparsely punctate. *Elytra* distinctly more than three times as long as the prothorax and equal in width to the disk of the latter, parallel, rather abruptly and obtusely rounded behind; disk somewhat strongly, asperately, but rather sparsely punctate, without series but with the impressed lines distinct except toward the sides, with a vague appearance of punctured series near the suture. Under surface finely, sparsely punctate throughout. *Legs* normal. Length 4.0 mm.; width 1.5 mm.

Indiana? Cab. Levette.

The single specimen is a male, and is remarkable in having eyes which are not only exceptionally large for the present genus, but in proportion to the size of the body, fully as large as in any other species of the family which I have seen. The elytra have, each, a large oblique basal spot of a reddish-yellow tint, as usual in this section of the genus. At first sight it resembles *Hymenorus humeralis*, but the tarsi are perfectly simple, the eyes large, the pubescence dark, more recumbent and sparser, and the elytra are devoid of distinct punctured series.

**M. basillaris** Say.—Journ. Ac. Phil., III, 1823, p. 269.

From the language employed by Say, it would seem as if this species might be easily recognized if discovered, but I have seen no specimens.

Say's description states that the head is punctured, the thorax hardly punctured, with three indefinite indented lines on the posterior margin; posterior angles rectangular; elytra with punctured striae and interstitial lines; basal oval spot oblique; body dark chestnut-brown, beneath paler. Length one-fifth of an inch.

Inhabits Pennsylvania.

**M. tenuis** Lec.—N. Spec. Col., 1866, p. 140.—Elongate, moderately convex, subparallel, polished, piceous-black above and beneath; legs pale flavate; antennae piceous, paler toward base; elytra each with a very small suffused reddish spot just behind the humerus, which is sometimes wanting; pubescence fine, rather short, very sparse and inconspicuous. *Head* evenly, feebly convex, rather coarsely but sparsely punctate; eyes rather large and convex, separated by nearly two-thirds more than their width; antennae rather slender, not attenuate toward apex, a little less than one-half as long as the body, the intermediate joints fully twice as long as wide, third distinctly longer than the fourth. *Prothorax* about one-fourth wider than the head, two-fifths wider than long, the apex three-fourths as wide as the base, subtruncate; base transverse, very feebly arcuate in the middle; sides parallel and nearly straight from the base almost to apical two-fifths where they are broadly subangulate and rounded; basal angles right, not at all rounded, not depressed; disk feebly convex, more strongly so laterally toward apex, rather strongly but very sparsely punctate throughout, not impressed in the middle, the basal foveae rather suffused but large and distinct. *Elytra* fully four times as long as the prothorax, and, throughout, nearly two-thirds wider, somewhat strongly narrowed behind in apical third; humeri rather broadly exposed, rounded; disk with somewhat vague, feebly impressed series of fine, feeble, not very approximate punctures, the intervals having sparsely placed punctures which are almost as large as those of the striae, arranged in rather uneven single series. Under surface very finely, sparsely punctured throughout. *Legs* as in *gracilis*. Length 5.2–6.0 mm.; width 1.7–1.9 mm.

New York; Ohio; Michigan.

This distinct species may be readily known by its slender form, small head and prothorax, flavate legs and by its feebly marked elytral series. In general form it approaches *procera*, but that species has the prosternal process laminate.

The specimen from New York has the prothorax trapezoidal, with the sides nearly straight and convergent from base to apex, the basal angles being slightly acute and the elytra relatively a

little longer. As it is precisely similar to the normal forms in every other particular, I am inclined to regard it as an accidental variation.

**M. foveata** Lec.—N. Spec. Col., 1866, p. 140.—Elongate, suboval, polished, moderately convex, piceous-black throughout, the legs and antennæ flavate; elytra sometimes testaceous throughout, but normally black, with a small suffused subhumeral reddish spot; pubescence short, fine, extremely sparse, dark and inconspicuous. *Head* suborbicular, feebly, evenly convex, finely, sparsely punctate; eyes very small, not prominent, separated by nearly four times their width; antennæ somewhat robust, not attenuate, scarcely two-fifths as long as the body, the intermediate joints strongly obconical, about one-half longer than wide, third quite distinctly longer than the fourth. *Prothorax* nearly one-half wider than the head, two-fifths wider than long, the apex subtruncate, three-fourths as wide as the base, the latter transverse and straight; sides strongly rounded at the middle, thence strongly convergent and feebly arcuate to the apex, and distinctly convergent and broadly sinuate to the basal angles, which are right and not at all rounded; disk strongly declivous toward the apical angles, finely but deeply, distinctly, sparsely punctate, narrowly, feebly impressed in the middle toward base; basal foveæ rounded, moderate in size, very deep and distinct. *Elytra* a little more than three times as long as the prothorax; sides feebly arcuate; disk slightly wider behind the middle, at base a little wider than the pronotal disk, the humeri distinctly exposed, narrowly rounded; surface with feebly impressed series of rather coarse, moderately close punctures, the intervals each with a single series of very fine punctures. *Abdomen* very finely sparsely punctate; anterior portions more coarsely but sparsely so. *Legs* moderately slender, normal. Length 5.0–5.8 mm.; width 1.8–2.2 mm.

Michigan; Iowa; Indiana.

The sinuation of the sides of the prothorax is not always so apparent as in the type, these often being convergent and straight from near the middle to the base; it is more apparent in the large specimens, and may therefore be more especially a female characteristic. Otherwise there does not appear to be any noteworthy sexual difference.

**M. gilvipes** n. sp.—Moderately robust and convex, suboval, polished, black; under surface dark rufo-testaceous, the legs flavate; antennæ piceous-black, paler toward base; each elytron with a large, clearly limited, oblique basal spot, extending to internal third of the width; pubescence rather long and erect, but dark, sparse and inconspicuous. *Head* feebly convex, rather coarsely but sparsely and feebly punctate; eyes rather small, separated by scarcely three times their width; antennæ robust, the joints strongly obconical, generally about one-half longer than wide, the third much longer than the fourth. *Prothorax* about one-third wider than long, the apex feebly arcuate,

three-fourths as wide as the base, the latter straight; sides broadly rounded, convergent and straight, or very feebly sinuate, from behind the middle to the base, the angles rather distinctly obtuse but not at all rounded; disk distinctly impressed in the middle toward base, rather coarsely, deeply and sparsely punctate, the basal foveæ small, deep and conspicuous. *Elytra* a little less than three times as long as the prothorax, and, behind the middle, about two-fifths wider; base slightly wider than the disk of the latter, the humeri distinctly exposed; sides feebly arcuate behind, gradually and acutely rounded at apex; disk punctured and impressed nearly as in *foveata*. Under surface very sparsely punctate, the abdomen minutely so. *Legs* rather short. Length 4.7 mm.; width 1.8 mm.

North Carolina.

The single specimen serving as the basis of the above description, represents a species closely allied to *foveata*, but distinguishable by its distinctly shorter broader elytra, smaller size, longer and more erect pubescence, slightly larger and more approximate eyes, blackish antennæ, much larger, more abruptly defined basal spots of the elytra, and slightly coarser punctuation.

**M. nigerrima** n. sp.—Oblong, parallel, moderately convex, highly polished, intense black throughout above; legs and under surface piceous-black, the tarsi paler; antennæ pale brownish-testaceous throughout; pubescence fine, short, dark, very sparse and inconspicuous. *Head* feebly, evenly convex, finely, very sparsely punctate; eyes rather small, separated by nearly three times their width; antennæ rather robust, barely more than one-third as long as the body, scarcely attenuate toward apex, the intermediate joints obconical, with the sides rounded, not quite one-half longer than wide, third and fourth equal. *Prothorax* four-fifths wider than long, the apex broadly arcuate, two-thirds as wide as the base, the latter transverse, with a small feeble sinuations at each side of the middle; sides broadly arcuate throughout, more convergent toward apex; basal angles obtuse and very narrowly rounded; disk extremely minutely, sparsely punctate, barely perceptibly impressed in the middle toward base, the basal foveæ broadly impressed and indefinite, but each apparently having a very small foveiform puncture in the middle. *Elytra* a little more than three times as long as the prothorax, and, at the middle, scarcely visibly wider than the disk of the latter, gradually, not very acutely rounded at apex; sides parallel and feebly arcuate; humeri not exposed; disk finely, sparsely punctate, without series, the impressed lines very feeble, but visible by obliquely reflected light, almost throughout the width, the punctures aggregated in wide longitudinal lines, with more sparsely punctate intervals. Under surface finely, sparsely punctate. *Legs* normal, the posterior tarsi much shorter than the tibiæ. Length 5.3 mm.; width 2.0 mm.

New York.

The single specimen representing this species is related to *fraterna*, but is immediately distinguishable by the complete absence



of basal pale spots on the elytra, by the finer sparser punctuation, smaller and more distant eyes and dark legs.

**M. gracilis** Lec.—Proc. Am. Phil. Soc., XVII, p. 615.—Elongate, moderately convex, subparallel, polished, black throughout; legs black, the tarsi slightly paler; antennæ dark rufo-ferruginous; pubescence fine, moderate in length, rather sparse and inconspicuous. *Head* with a feeble impression at the middle of the interocular surface, rather coarsely but sparsely punctate; eyes large and convex, separated by two-fifths more than their own width; antennæ nearly two-fifths as long as the body, robust, feebly attenuate toward apex, the intermediate joints fully three-fourths longer than wide, feebly obconical, third and fourth equal in length. *Prothorax* about one-third wider than the head, nearly one-half wider than long, the apex two-thirds as wide as the base, subtruncate; base transverse, the sinuations almost obsolete; sides subangulate at apical third, thence very feebly divergent and straight to the basal angles, more strongly convergent and nearly straight to the apex; basal angles right, not rounded; disk very feebly convex, except toward the sides anteriorly where it becomes strongly declivous, rather finely but deeply, distinctly, very sparsely punctate, the punctures becoming coarse and rather dense laterally and anteriorly, broadly, strongly impressed along the middle toward base, the basal foveæ almost obsolete. *Elytra* about four times as long as the prothorax, and, throughout, about three-fourths wider, parallel, the humeri exposed and slightly rounded; apex rather gradually and acutely rounded; disk with even series of small deep close-set punctures, the rows scarcely visibly impressed, the intervals flat, each with a rather uneven single series of smaller punctures. Under surface very finely, sparsely punctate throughout, except the metasternum which is rather more coarsely and densely so, the latter as usual totally impunctate posteriorly. *Legs* slender, the basal joint of the hind tarsi fully as long as the remainder. Length 5.5 mm.; width 2.0 mm.

Michigan (Marquette). Cab. LeConte.

The unique type has the partly concealed apical pseudosegment narrow and strongly rounded at apex. I cannot determine its sex, but it is probably a male.

This species somewhat resembles *tenuis*, but may be distinguished by its more robust form, larger eyes, more distinct elytral series, absence of humeral pale spot and several other characters.

**M. rufipes** Lec.—Bost. Journ., I, p. 170.—Oblong, parallel, rather strongly convex, dark piceous-brown, the under surface rufo-testaceous; legs flavate; antennæ brown, paler toward base; integuments shining; pubescence rather coarse, moderate in length, fulvous, dense and conspicuous. *Head* broad, inserted in the prothorax nearly to the eyes, feebly, evenly convex, coarsely, rather densely punctate, the punctures distinctly separated; eyes rather small, separated by about two and one-half times their width; antennæ

slender, not attenuate, nearly one-half as long as the body, the intermediate joints fully twice as long as wide, third distinctly shorter than the fourth. *Prothorax* about two-thirds wider than long; sides nearly parallel, feebly arcuate, rounded anteriorly, the apex feebly arcuate and but slightly narrower than the base, the latter transverse, the sinuations almost obsolete; basal angles slightly obtuse, not at all rounded; disk transversely convex from base to apex, not impressed, coarsely, extremely densely, deeply punctate throughout, the punctures nearly in mutual contact; basal foveæ obsolete. Scutellum rather short and broad. *Elytra* about three times as long as the prothorax, and, throughout, about one-fifth wider, parallel, obtusely rounded behind; disk cylindrically convex, polished, with almost unimpressed series of small but deep, close-set punctures, the intervals extremely minutely, sparsely punctate. *Abdomen* very minutely, sparsely punctate, the metasternum more coarsely but sparsely so, the prosternum and propleuræ not very coarsely, but extremely densely so. *Legs* rather short and robust, but otherwise normal. Length 4.5 mm.; width 1.8 mm.

New York. Cab. LeConte.

The unique type represents a very isolated species, not remotely approaching any other, although in general somewhat recalling *marginata* of the next group. I do not know the sex of the specimen described, but it is apparently the female.

### ✱✱

**M. marginata** Lec.—Proc. Am. Phil. Soc., XVII, p. 618.—Oblong-elongate, subparallel, moderately convex, black throughout; antennæ and legs concolorous; elytra with a rather distinctly limited red spot at the humeri, polished, the pubescence short, fine, moderately dense but not conspicuous. *Head* feebly convex, coarsely, deeply, rather densely punctate, the punctures separated by nearly their own diameters; eyes small, separated by about three times their own width; antennæ short and robust, a little more than one-third as long as the body, joints after the third strongly obconical, the latter cylindrical and fully as long as the fourth, intermediate joints nearly one-half longer than wide, toward apex gradually attenuated. *Prothorax* one-half wider than long; sides nearly parallel, rather feebly, evenly arcuate, rounded at apex, the latter four-fifths as wide as the base, truncate; base transverse, the angles very slightly obtuse but not rounded; disk narrowly, strongly explanate along the sides, coarsely, deeply punctate, the punctures separated by from once to twice their own widths, but densely aggregated in a large irregular spot in the middle at each side; basal foveæ large and shallow but distinct. *Elytra* about three and one-half times as long as the prothorax, and, near the middle, about one-third wider, at base just visibly wider than the base of the prothorax; humeri right, narrowly rounded; apex abruptly and obtusely rounded; disk with very feebly impressed even rows of small deep close-set punctures, the series becoming deeper and the punctures larger toward the suture; intervals scarcely convex, finely, sparsely and unevenly

punctate. *Abdomen* very finely, sparsely punctate. *Legs* slender; tibiæ rather densely clothed with short coarse fulvous hairs; posterior tarsi scarcely three-fourths as long as the tibiæ, with the basal joint very much shorter than the remainder. Length 5.0 mm.; width 1.9 mm.

Michigan (Marquette). Cab. LeConte.

The unique type is a female, and the species is quite isolated as far as known, the very coarse punctuation reminding us only of *rufipes*.

**M. binotata** Say.—Long's Expd., II, 1824, p. 285.—Oblong-elongate, parallel, moderately convex; body throughout, legs and antennæ black; tarsi paler; each elytron with a large rounded humeral pale reddish spot; surface polished; pubescence rather long, semi-erect, dark, not very dense, moderately conspicuous. *Head* feebly convex, coarsely, somewhat unevenly punctate, the punctures generally separated by their own diameters or more; eyes moderate, rather convex, separated by twice their width; antennæ a little less than one-third as long as the body, rather robust, feebly attenuate toward apex, the intermediate joints distinctly obconical, about one-half longer than wide, third scarcely longer than the fourth. *Prothorax* three-fourths wider than long, the apex subtruncate, two-thirds as wide as the base, the latter transverse, the narrow sinuation at each side of the middle feeble; sides broadly rounded anteriorly, distinctly convergent and nearly straight from behind the middle to the basal angles, which are obtuse but not rounded; disk broadly, very indefinitely impressed along the middle, rather coarsely, deeply and somewhat sparsely punctate, the basal foveæ rounded, feebly impressed. *Elytra* rather more than four times as long as the prothorax, and, throughout, equal in width to the disk of the latter, parallel, the sides straight, gradually, rather acutely rounded behind, the two bases equal in width; disk with scarcely impressed series of small moderately close-set punctures, which almost disappear completely toward apex, the intervals finely, sparsely and confusedly punctate. *Abdomen* and metasternum very finely, sparsely punctate, the prosternum and propleuræ more coarsely and much more densely so. *Legs* rather short, slender, basal joint of the hind tarsi as long as the remainder. Length 6.6–7.5 mm.; width 2.5–2.6 mm.

Michigan (Marquette); New York.

The anterior coxal cavities are by no means confluent as stated by LeConte (N. Spec. Col., 1866, p. 138, foot-note), but the thin lamina separating them is almost completely hidden below and between the unusually large and prominent coxæ. This lamina gradually becomes broader behind, and widely separates the side-pieces of the prosternum at the posterior margin; it is on the same level as the latter throughout its length.

This is a large and conspicuous species, readily known by its

oblong parallel form and coloration. The two or three basal joints of the antennæ and the palpi, are dark rufo-testaceous.

**M. longula** Lec.—Proc. Am. Phil. Soc., XVII, p. 618.—Elongate, subparallel, rather strongly, convex, flattened toward the middle, polished, black throughout; legs and antennæ concolorous; elytra each with a small rounded rufo-testaceous spot at the humerus; pubescence fine but rather long, sparse but distinct. *Head* feebly convex, rather coarsely but not very densely punctate; eyes large, separated by but slightly more than their own width; antennæ robust, about two-fifths as long as the body, the joints generally feebly obconical and one-half longer than wide, third and fourth subequal. *Prothorax* two-thirds wider than long; apex subtruncate, two-thirds as wide as the base, the latter transverse; sides broadly rounded and convergent anteriorly, becoming parallel and nearly straight toward base, the basal angles right, not distinctly rounded; disk strongly declivous anteriorly and laterally, elsewhere feebly convex, rather coarsely, sparsely, but roughly punctured, feebly impressed in the middle toward base, the basal foveæ shallow but distinct. *Elytra* between four and five times as long as the prothorax, and, throughout, about two-fifths wider, the humeri narrowly exposed; apex rather abruptly and obtusely rounded; sides parallel and nearly straight; disk with feebly impressed series of small inconspicuous punctures, the striæ not distinct except toward the suture; intervals throughout with very fine punctures, arranged in more or less even rows. Under surface sparsely finely punctate. *Legs* rather long, normal, the hind tarsi but slightly shorter than the tibiæ, with the basal joint nearly as long as the remainder. Length 5.5 mm.; width 1.9 mm.

Michigan (Detroit). Cab. LeConte.

The prothorax in general outline is similar to the prevailing type in *Hymenorus*. The anterior coxæ are large, subcontiguous, conoidal and prominent, the cavities separated by a very narrow lamina, apparently horizontal and almost completely concealed by the coxæ.

This species is quite isolated, although bearing a remote general resemblance to several others such as *tenuis* and *procera*. It is represented, as far as known to me, only by the original unique type, taken by Mr. Schwarz.

**M. bicolor** Coup.—The Canad. Nat., 1865, p. 62.—Oblong-elongate, rather convex, highly polished, intense black above; under surface, legs and antennæ pale rufo-testaceous, the propleuræ, epipleuræ, metasternal episterna and last two ventral segments blackish; pubescence short, very sparse, dark and inconspicuous. *Head* feebly, evenly convex, finely, very sparsely punctate; eyes moderate, rather convex, separated by twice their own width; antennæ rather slender, nearly two-fifths as long as the body, the intermediate joints feebly obconical, more than twice as long as wide, third rather



longer than the fourth. *Prothorax* two-thirds wider than long, the apex truncate, three-fourths as wide as the base, the sinuations of the latter rather distinct, the basal angles extending posteriorly slightly beyond the median parts, right, not at all rounded, not prominent; sides broadly rounded anteriorly, feebly convergent and nearly straight thence to the base; disk widest distinctly before the middle, minutely, very sparsely punctate, the punctures slightly coarser and denser toward the sides, narrowly, feebly impressed in the middle toward base, the basal foveæ very small, rounded, deep and almost perforate. *Elytra* four times as long as the prothorax, and, behind the middle, one-half wider, at the humeri slightly wider than the pronotal disk, the humeri very slightly exposed; apex rather abruptly and obtusely rounded; sides broadly arcuate behind; disk with very deeply impressed series of moderate, rather deep punctures, the intervals convex, minutely, sparsely and confusedly punctate. Under surface very finely, sparsely punctate, the metasternum much more finely and sparsely so than its episterna. *Legs* moderate in length, the femora rather robust, the first joint of the hind tarsi distinctly shorter than the remainder. Length 8.5 mm.; width 3.4 mm.

Canada. Cab. LeConte.

This is a remarkably distinct species, immediately recognizable by the smooth, highly polished, minutely, sparsely punctate surface and deeply impressed, almost sulciform elytral striæ. The maxillary palpi do not differ much from those of *lugubris* and *analís*.

The narrow lamina separating the anterior coxæ is convex longitudinally, but comes far from attaining the level of the coxal apices.

**M. analís** Lec.—Proc. Am. Phil. Soc., XVII, p. 618.—Elongate-oval, moderately convex, dark piceous-brown; under surface and antennæ paler, brownish-testaceous, the last two abdominal segments darker, piceous; legs paler, more flavate; polished; pubescence fine, rather sparse, dark and inconspicuous. *Head* feebly, evenly convex, rather coarsely, densely, deeply punctate; eyes moderate, separated by rather distinctly more than twice their width; antennæ two-fifths as long as the body, nearly as in *lugubris*, but with the third joint very slightly shorter than the fourth. *Prothorax* two-thirds wider than long, the apex truncate, three-fourths as wide as the base, the latter transverse; sides broadly, almost evenly rounded throughout; basal angles obtuse, very narrowly rounded; disk somewhat coarsely, moderately closely punctate, the punctures finer, feebler and more distant than those of the head, not explanate at the sides, not appreciably impressed in the middle, the basal foveæ almost obsolete. *Elytra* nearly four times as long as the prothorax, and, behind the middle, nearly one-half wider, at the humeri very slightly wider than the disk of the pronotum; humeri not exposed; apex rather abruptly and obtusely rounded; sides broadly arcuate behind; disk with feebly impressed series of small, rather inconspicuous punctures, the intervals feebly convex, finely, confusedly and rather sparsely punctate, the

series rather uneven in their course, the intervals varying in width. Under surface, legs and coxæ nearly as in *lugubris*. Length 6.8–7.6 mm.; width 2.8–3.0 mm.

New Jersey; Michigan.

This species is closely allied to *lugubris*, but may be distinguished by its slightly smaller eyes, the unexplanate sides of the prothorax, and more feebly impressed, less conspicuously punctured and more uneven elytral striæ, as well as by its rather larger size and more robust form.

One specimen before me, from New York, is black above and piceous-black throughout beneath, and, as I notice a few other slight differences, it may possibly indicate a variety.

The maxillary palpi are rather shorter and thicker than in *lugubris*, the recti-triangular fourth joint being but slightly longer than wide.

**M. lugubris** Lec.—Proc. Am. Phil. Soc., XVII, p. 618.—Elongate-oval, rather convex, piceous-black; under surface throughout paler, brown; legs and antennæ still paler, more flavate; polished, the pubescence very fine, semi-erect, short, moderately dense but nearly of the same color as the body and not conspicuous. *Head* feebly convex, coarsely, deeply, rather densely punctate; eyes moderate, separated by about twice their width; antennæ moderately robust, scarcely two-fifths as long as the body, feebly attenuate toward apex, joints obconical, in the male nearly twice as long as wide, a little shorter in the female, third and fourth equal. *Prothorax* two-thirds wider than long; apex truncate or very feebly sinuate, two-thirds as wide as the base, the latter transverse and straight; sides broadly, almost evenly rounded throughout, more convergent toward apex; basal angles obtuse and very narrowly rounded; disk distinctly explanate from just before the middle, more broadly around the basal angles, and thence gradually more narrowly along the base, rather coarsely, deeply, somewhat unevenly and densely punctate, the punctures separated by about their own widths; broadly, feebly impressed in the middle toward base, the basal foveæ extremely feeble and indefinite. *Elytra* nearly four times as long as the prothorax, and, behind the middle, two-fifths wider, rather abruptly and obtusely rounded behind, at the humeri just visibly wider than the disk of the pronotum, the humeri not exposed; sides broadly arcuate, especially behind; disk with rather deeply impressed regular series of rather small but deep close-set punctures, the intervals convex, finely, confusedly and somewhat closely punctate. Under surface finely, sparsely punctate, a little more coarsely so anteriorly. *Legs* slender, normal. Length 6.4–7.0 mm.; width 2.3–2.9 mm.

New York; Kansas.

The anterior coxæ are large, very prominent and approximate, globulo-conoidal, the cavities separated by a thin lamina which is

apparently on the same level as the prosternum. The fourth joint of the maxillary palpi is in the form of a right-angled triangle, thick, convex, twice as wide, and more than twice as long as the third. The abdomen is a little more densely and finely punctured toward apex.

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**M. longipennis** n. sp.—Oblong-elongate, rather depressed, parallel, polished, rather pale piceous-brown throughout; legs more flavate; pubescence fine, short, not dense, pale but inconspicuous. *Head* rather large, transversely flat between the eyes, which are very large and prominent, separated by about their own width; punctures rather dense, somewhat coarse and confused; antennæ nearly two-fifths as long as the body, moderately robust, feebly, gradually attenuate, third joint long, distinctly longer than the fourth, joints five to eleven equal in length and much shorter than the fourth. *Prothorax* scarcely one-half wider than the head, three-fourths wider than long; apex truncate, two-thirds as wide as the base, the latter transverse, the lateral sinuations broad but distinct; sides broadly rounded and convergent anteriorly, parallel and nearly straight in basal half; basal angles right, very narrowly rounded; disk rather abruptly, narrowly explanate at the sides anteriorly, gradually deplanate toward the basal angles, broadly, feebly impressed along the middle, not very densely, rather coarsely and roughly punctate; basal foveæ broadly, feebly impressed and indefinite. *Elytra* nearly five times as long as the prothorax, and, throughout, about one-fourth wider, parallel, the sides straight; humeri rather abruptly rounded and slightly exposed; apex somewhat abruptly obtusely rounded; disk finely, rather sparsely punctate, the impressed lines rather distinct throughout the width, the punctures having a generally closely seriate arrangement, but without any definite series of larger punctures. Under surface very sparsely, finely punctate. *Legs* normal, the basal joint of the hind tarsi nearly as long as the remainder. Length 6.8 mm.; width 2.2 mm.

California (San Bernardino).

The anterior coxæ are large but not very prominent, and are separated throughout their length and depth by a thin prosternal lamina, the exposed surface of which is strongly, longitudinally convex. The species is not closely allied to any other before me, and may be known by its parallel depressed form, large eyes and peculiar antennal structure.

**M. pacifica** n. sp.—Oblong, rather feebly convex, subparallel, piceous-black, the under surface but slightly paler; legs and antennæ dark brown; lustre shining, the anterior parts just visibly alutaceous; pubescence very short, sparse, recumbent and inconspicuous. *Head* rather convex, finely, rather sparsely punctate, the epistoma abruptly deplanate; eyes small, sepa-

rated by nearly three times their width; antennæ rather slender, but slightly more than one-third as long as the body, joints moderately obconical, about three-fourths longer than wide, the third and fourth equal in length. *Prothorax* rather large, two-thirds wider than long, the apex subtruncate, nearly as wide as the base, the latter transverse, the sinuations broad and distinct; sides somewhat strongly arcuate, the apical angles broadly rounded, basal slightly obtuse but not rounded; disk a little wider before the middle than at base, broadly, feebly but distinctly impressed throughout along the middle, finely, but strongly, rather sparsely punctate, the basal foveæ large and feebly impressed. *Elytra* about twice as long as wide, not quite four times as long as the prothorax, and, in the middle, very slightly wider than the latter, rather obtusely parabolic at apex; sides parallel and feebly arcuate, the two bases equal, humeri not exposed; disk with feebly impressed lines, more distinct toward the suture, the lines minutely, feebly punctate, the intervals finely, confusedly, rather sparsely punctate, the punctures rather larger and more distinct than those of the striæ. *Abdomen* sparsely, extremely minutely and scarcely perceptibly punctate. *Legs* slender, the basal joint of the hind tarsi about as long as the remainder. Length 7.0 mm.; width 2.5 mm.

#### California.

The sex of the unique type is not apparent and cannot be determined without dissection. This species is not closely allied to any other and may be readily distinguished by the characters given in the table.

**M. procera** n. sp.—Elongate, subdepressed, shining, piceous-black throughout, the tarsi slightly paler; pubescence fine, short, dark, moderately dense, not conspicuous. *Head* small, feebly convex, more or less finely and sparsely punctate; eyes moderate, rather convex, separated by a little less than twice their width; antennæ very slender, filiform, nearly one-half as long as the body, third joint fully three times as long as the second and distinctly longer than the fourth. *Prothorax* small, but slightly wider than the head, about one-half wider than long; apex subtruncate, three-fourths as wide as the base, the latter broadly, just visibly arcuate; sides almost straight and parallel in basal two-thirds, then broadly rounded to the apex; basal angles right, not rounded; disk feebly convex, more or less finely and sparsely, but very distinctly punctate, broadly, feebly impressed in the middle near the basal margin, broadly explanate toward the basal angles, the basal foveæ nearly obsolete. *Elytra* between five and six times as long as the prothorax, and, behind the middle, about twice as wide; sides parallel, feebly arcuate behind; apex rather abruptly ogival; humeri broadly rounded and widely exposed; disk finely, somewhat densely punctate, the fine, feebly impressed lines distinct, but without definite punctured series, the punctures generally however with a closely subseriate arrangement. Under surface polished, very finely, sparsely punctate. *Legs* long, rather slender; posterior tarsi equal in length to the tibiae, the basal joint scarcely longer than the next two combined. Length 5.5–6.0 mm.; 1.8–2.0 mm.



Idaho; California (Los Angeles).

The last joint of the maxillary palpi is moderately robust, scarcely twice as long as wide, the two sides making an angle of about sixty degrees at base, the inner about one-half as long as the outer and three-fourths as long as the apex. The anterior coxæ and extremely thin prosternal lamina are nearly as in *longipennis*, from which the present species can at once be known by its more slender depressed form, small head and prothorax and long posterior tarsi, with unusually short basal joint.

The specimen from California has the head, and to some extent also the prothorax, much more densely punctate than that from Idaho, and the head is a little larger in the former. These differences are probably in great part sexual, and I think generally but little reliance is to be placed upon degree of punctuation in the present genus. The genera with lobed tarsi are much more constant in specific characters.

**M. pubipennis** Lec.—Proc. Am. Phil. Soc., XVII, p. 617.—Parallel, moderately convex, polished, dark brown throughout; pubescence dark, fine, semi-erect, rather dense. *Head* feebly convex, finely, sparsely punctate; eyes small, lateral, transverse, above separated by nearly five times their width; antennæ two-fifths as long as the body, rather robust, joints obconical, generally one-half longer than wide, the third a little longer than the fourth. *Prothorax* but slightly more than one-third wider than the head, one-half wider than long, the apex truncate, very nearly as wide as the base, the latter transverse; sides feebly arcuate throughout, a little more strongly so anteriorly, feebly convergent thence to the basal angles, which are obtuse but not rounded; disk widest a little before the middle, somewhat finely and sparsely but very distinctly punctate, broadly, feebly impressed in the middle toward base, also feebly impressed or subexplanate near the basal angles; basal foveæ not noticeable. *Elytra* fully three times as long as the prothorax, and, at the middle, just visibly wider; humeri but very slightly exposed; apex rather gradually, evenly ogival; sides parallel, very feebly arcuate; disk with very feebly impressed series of fine, rather approximate punctures, which become obsolete toward the sides and apex; intervals throughout very finely, unevenly and rather densely punctate. Under surface finely, sparsely punctate. *Legs* rather short, the femora somewhat stout; hind tarsi much shorter than the tibiæ, with the basal joint much shorter than the remainder. Length 4.7 mm.; width 1.8 mm.

California (southern).

The anterior coxæ are moderate in size, not very prominent, and separated throughout their depth by a narrow, longitudinally convex lamina. The fourth joint of the maxillary palpi is more than

twice as long, and nearly twice as wide as the third, the sides making an angle at the base of about eighty degrees, the inner scarcely one-half as long as the outer, and the outer but slightly longer than the apex, the angles not rounded and the bounding lines nearly straight.

This species may be easily known by its dark brown color, rather long dense and dark brown pubescence and small eyes.

**M. nevadensis** n. sp.—Oblong, broad, rather depressed, polished, dark piceous-brown above, the under surface, legs and antennæ paler and more flavate; pubescence very short and sparse, pale but inconspicuous. *Head* feebly convex, finely, sparsely punctate; eyes small, separated by scarcely four times their width; antennæ robust, scarcely two-fifths as long as the body, the joints obconical and nearly three-fourths longer than wide, the third not distinctly longer than the fourth. *Prothorax* three-fourths wider than the head and four-fifths wider than long, the apex truncate or very feebly sinuate, rather distinctly narrower than the base, the latter transverse; sides broadly rounded; basal angles obtuse and slightly rounded; disk sometimes broadly feebly impressed along the middle, the impression evanescent, very finely, sparsely punctate, the punctures becoming denser toward the sides; basal foveæ large, feeble and indefinite. *Elytra* three times as long as the prothorax, at base rather distinctly wider than the disk of the latter, and, at the middle, about one-third wider, rather abruptly and obtusely rounded behind; humeri very narrowly exposed; disk finely, sparsely punctured, with feeble traces of impressed lines toward the suture, but without trace of punctured series. Under surface polished, very finely and sparsely punctate. *Legs* moderate in length, hind tarsi rather slender, much shorter than the tibiæ, with the basal joint four times as long as wide and three-fourths as long as the remainder. Length 4.8 mm.; width 2.1 mm.

Nevada (Reno).

This species belongs to a small group peculiar to the Pacific coast, including also *pubipennis* and *crassulipes*; it is readily distinguishable from either of these by its much broader form, more transverse prothorax, distinctly larger eyes and complete absence of punctured series. One specimen has two discal foveæ on the prothorax, of an adventitious nature, similar to those which appear occasionally throughout the Tenebrionidæ. The coxæ are similar to those of *pubipennis*, but the palpi are rather shorter and more robust.

**M. crassulipes** n. sp.—Rather slender, suboval, moderately convex, pale ochreous-flavate throughout, polished; pubescence rather short and coarse, sparse, pale ochreous-flavate in color. *Head* feebly convex, finely, sparsely punctate, the eyes small, lateral, transverse, not prominent, separated above by between four and five times their width; antennæ very robust,

scarcely two-fifths as long as the body, the joints generally strongly obconical and but slightly longer than wide, the third nearly one-half longer than the fourth. *Prothorax* nearly two-thirds wider than long, the apex truncate, nearly as wide as the base, the latter transverse; sides broadly rounded anteriorly, straight or feebly sinuate and rather strongly convergent thence to the basal angles, which are obtuse and not rounded; disk much wider slightly before the middle than at base, not noticeably impressed in any part, somewhat coarsely and sparsely punctured, the basal foveæ entirely obsolete. *Elytra* between three and four times as long as the prothorax, and, at the middle, nearly one-half wider, gradually, evenly ogival at apex; humeri narrowly rounded, rather broadly exposed, the width at this point distinctly greater than that of the pronotal disk; sides feebly but distinctly arcuate throughout; disk rather finely, sparsely and confusedly punctate, with feebly impressed lines and series of punctures toward the suture only. Under surface finely, sparsely punctate. *Legs* short and unusually robust, the hind tarsi much shorter than the tibiae, with the basal joint not more than three times as long as wide, and but little longer than the next two. Length 4.0 mm.; width 1.6 mm.

California (Hoopa Valley, Humboldt Co.).

Easily distinguishable from *pubipennis* by its pale color, smaller, more cordate and unimpressed prothorax, much shorter, more robust antennal joints, pale shorter and coarser pubescence, sparser punctuation and shorter more robust legs and tarsi. The unique specimen is a female and the before described type of *pubipennis* is also of that sex.

#### ISOMIRA Muls.

Although the species here assigned to *Isomira* have a community of habitus which decidedly indicates the propriety of associating them together, it is difficult to state any absolutely definitive structural characters. The maxillary palpus varies, in its terminal joint, from the slender form seen in *sericea*, through the rather broadly triangular of *pulla*, to the form seen in *quadristriata*. The antennæ have the third and fourth joints equal in rather more than half the species, but in the remainder the former is much the shorter of the two, sometimes approaching the form seen in *Cistela* and the European *antennata*. The elytra may be almost completely devoid of impressed striæ, or may have more or less feebly impressed rows of punctures as in *valida*, *texana* and many of the Central American forms.

The only character which satisfactorily distinguishes the genus from *Cistela*, apart from the very pronounced peculiarity of facies,

appears to be the slender filiform antennæ, a differential character corresponding with that made use of by Mr. Champion for the separation of *Allecula* and *Hymenorus*.

Our species are found on foliage of low plants and are moderately abundant. They are easily differentiated as follows:—

Elytra without distinct series of punctures.

Fourth joint of the maxillary palpi long and slender.

Antennæ with the third joint distinctly shorter than the fourth, at least in the male.

Eyes very large, the front broadly, deeply impressed; color pale throughout ..... **iowensis**

Eyes small or moderate; front not impressed.

Color black, the prothorax rufo-ferruginous; elytral punctuation sparse ..... **discolor**

Color piceous-black throughout; elytral punctuation extremely dense. **tenebrosa**

Antennæ with the third and fourth joints equal or subequal, elongate.

Eyes moderate; elytral punctuation and pubescence exceedingly dense; color pale ochreous-flavate throughout ..... **sericea**

Eyes small, not prominent; punctuation of the head and pronotum fine, very dense; elytral punctures sparser; color variable.

**variabilis**

Eyes very small, convex and prominent; head and pronotum rather coarsely punctate; size smaller ..... **luscitiosa**

Fourth joint much shorter and more dilated, but with the outer side distinctly longer than the apex; punctuation very dense throughout; color piceous-black ..... **pulla**

Fourth joint robust, the outer side but slightly longer than the apex.

Elytral punctuation sparse; eyes small, the elytra without impressed lines except the two sutural toward apex.

Third and fourth antennal joints equal in both sexes; prothorax small, much narrower than the elytra ..... **quadristriata**

Third joint shorter than the fourth; prothorax larger, subequal in width to the elytra ..... **monticola**

Elytral punctuation dense; eyes large; third antennal joint shorter than the fourth; elytra with fine but distinct impressed lines throughout the width ..... **oblongula**

Elytra with series, more or less complete and sometimes feebly impressed, of small punctures; maxillary palpi with the terminal joint but slightly shorter and more robust than in *sericea*; eyes large.

Eyes in the male separated by scarcely two-thirds their own width.

**valida**

Eyes in the male separated by fully their own width; form more oblong and parallel; elytral series feebly impressed ..... **texana**



**I. iowensis** n. sp.—Almost evenly elliptical, convex, pale brownish-piceous, the head and prothorax slightly more rufo-ferruginous; surface shining, the pubescence very short and somewhat sparse. *Head* very densely and somewhat coarsely punctate, the front broadly, strongly impressed; eyes very large; antennæ slender, filiform, three-fifths as long as the body. *Prothorax* four-fifths wider than long; sides feebly convergent from the base, more strongly so and broadly rounded anteriorly; apex feebly arcuate, two-thirds as wide as the base, the latter transverse and nearly straight; basal angles right; disk punctured like the head, the punctures unusually coarse, deep and distinct, nearly in mutual contact; basal foveæ very feeble, transverse, on the posterior convexity and bordering the edge. *Elytra* nearly four times as long as the prothorax, and, at the middle, about one-half wider; disk finely and rather sparsely punctate, the feeble impressed lines quite distinctly visible by reflected light throughout the width, the two sutural strong toward apex. Under surface polished; abdomen minutely and sparsely punctate; metasternum rather coarsely and sparsely so, with an unusually large impunctate area in front of the transverse groove. *Legs* long and very slender, the hind tarsi nearly as in *sericea*.

*Male*.—Eyes separated by scarcely one-fourth more than their own width; third joint of the antennæ two-thirds as long as the fourth.

Length 5.2 mm.; width 2.2 mm.

#### Iowa.

The single specimen before me seems to be slightly immature. The maxillary palpi are nearly as in *sericea*, but with the inner angle of the terminal joint rather more broadly rounded.

This is a rather isolated species, at once distinguishable by its large eyes, strongly impressed front, sparse punctuation and antennal structure.

**I. discolor** n. sp.—Elongate-elliptical, moderately convex, rather strongly shining, piceous-black, the antennæ and legs throughout concolorous; pronotum and prosternum pale ferruginous; pubescence fine, very short, sparse. *Head* feebly convex, closely, rather coarsely punctate, with a small elongate impression in the middle and just behind the epistoma; eyes rather small; antennæ filiform, fully two-thirds as long as the body. *Prothorax* about two-thirds wider than long, the apex truncate, two-thirds as wide as the base, the latter truncate, the lateral sinuations almost invisible; basal angles right, not appreciably rounded; sides broadly, almost evenly rounded, nearly straight and parallel toward base; disk rather coarsely, very closely punctured, the interspaces shining; basal foveæ small, rounded, distinct. *Elytra* a little more than three times as long as the prothorax, and, in the middle, about one-third wider, moderately narrowly rounded at apex; disk finely but deeply and distinctly, rather sparsely punctate, polished, without trace of impressed striae except the two sutural, which are feebly visible toward the apex. Under surface polished, finely and very sparsely punctate except the prosternum,

which is duller and densely punctured. *Legs* slender, moderate in length; first joint of the hind tarsi slightly longer than the last two combined.

*Male*.—Third antennal joint about two-thirds as long as the fourth; eyes separated by a little more than twice their own width.

Length 3.5–4.0 mm.; width 1.4–1.6 mm.

#### California.

This is our smallest species, and is very distinct in its coloration and sparse, coarse punctuation, as well as in antennal structure.

The head is distinctly shining, the comparatively wide interspaces of the punctures being polished. The abbreviated third joint of the antennæ is probably not altogether a sexual character.

**I. tenebrosa** n. sp.—Elongate-elliptical, strongly convex, extremely finely and densely punctate and pubescent, rather dull and subsericeous, piceous-black; legs and antennæ paler. *Head* feebly convex, the punctures densely crowded; eyes rather small; antennæ filiform, moderate in length, in the male scarcely more than one-half as long as the body; joints slightly shorter in the female. *Prothorax* about two-fifths wider than long, the apex more or less strongly arcuate, and generally continuous in curvature with the sides, the latter parallel and nearly straight toward base; basal angles slightly obtuse and rather distinctly rounded; base transverse, just visibly arcuate in the middle; disk very finely, extremely densely punctured, feebly impressed in the middle toward base, the basal foveæ broadly impressed along the margin, feeble. *Elytra* three times as long as the prothorax, and, at the middle, about one-third wider; sides evenly arcuate; humeri not exposed; apex gradually acutely rounded; disk punctured and clothed as in *sericea*, the two subsutural lines alone distinct toward apex. *Legs* normal.

*Male*.—Eyes separated by rather more than twice their width; third antennal joint slightly shorter than the fourth.

Length 4.4–4.8 mm.; width 1.9–2.0 mm.

#### New York (near the city and at Buffalo).

This species is quite slender, nearly similar in shape, and in its extremely dense punctuation, to *sericea*; it differs in its much smaller size, dark piceous-black color, shorter antennæ, slightly smaller eyes and still more decidedly in the form of the fourth joint of the maxillary palpi, which is here very slender, twice as long as, and not quite one-half wider than, the third, with the inner side three-fourths as long as the outer and much longer than the apex, the latter much less oblique and narrower than in any other species.

**I. sericea** Say.—Journ. Ac. Phil., III, p. 270.—Elongate-elliptical, rather strongly, evenly convex, feebly shining, pale ochreous-flavate throughout, the pubescence fine, dense, very short and subsericeous. *Head* dull, extremely

densely punctate, feebly, evenly convex; eyes moderate; antennæ long and slender, filiform, nearly two-thirds as long as the body, with the third and fourth joints equal in both sexes. *Prothorax* one-half wider than long, the sides rounded anteriorly, nearly straight and parallel in basal half; apex about two-thirds as wide as the base, feebly arcuate; base transverse, broadly, feebly arcuate in middle half, the angles right, not rounded; disk dull, punctured like the head, the basal foveæ shallow but rather distinct. *Elytra* nearly four times as long as the prothorax, and, in the middle, about one-third wider, between the narrowly rounded humeri very slightly wider than the thoracic base, rather acute at apex, the disk somewhat more shining than the anterior portions, but exceedingly densely, finely punctured, with three or four feeble impressed striæ near the suture, more strongly marked toward apex, the striæ where more deeply impressed becoming also very minutely punctate, elsewhere without trace of serial punctuation. Under surface decidedly more shining, the abdomen very minutely, feebly and densely punctate, the anterior portions more coarsely and rather densely so. *Legs* rather long, very slender; posterior tarsi a little shorter than the tibiæ, with the first joint three-fourths as long as the next three.

*Male*.—Eyes separated by three-fourths more than their own width; fifth ventral slightly longer and less truncate than in the female, more or less feebly impressed.

Length 4.8–5.5 mm.; width 1.9–2.3 mm.

Massachusetts; North Carolina.

The last joint of the maxillary palpi is about twice as long as the third, and about one-half wider, with the inner side one-half as long as the outer, the apex obliquely truncate. In the female the eyes are but slightly smaller than in the male, and the joints of the antennæ a very little shorter and thicker. This is the most abundant of our eastern species.

***I. variabilis*** Horn.—Trans. Am. Ent. Soc., Sept. 1875, p. 156.—Oval, more or less robust and convex, sometimes slightly wider behind the middle, piceous-black or paler, dull, the elytra shining; pubescence fine, short and comparatively sparse. *Head* feebly, nearly evenly convex, very densely and rather finely punctate; eyes small; antennæ slender, filiform, one-half as long as the body. *Prothorax* about two-thirds wider than long, gradually narrowed from base to apex, the latter scarcely more than one-half as wide as the base, feebly arcuate; sides broadly rounded anteriorly; base transverse, the sinuations broad and very feeble; disk extremely densely and rather finely punctate, the basal foveæ broadly impressed and feeble. *Elytra* about three and one-half times as long as the prothorax, and, near the middle, from one-third to one-half wider, not very acutely rounded at apex; disk very finely, somewhat sparsely punctate, with scarcely a trace of impressed striæ except the two inner. *Abdomen* minutely, not densely punctate, the metasternum

coarsely and rather densely so, the prosternum dull, finely and very densely punctured. *Legs* slender, generally pale.

*Male*.—Eyes separated by about three times their width.

Length 4.3–5.9 mm.; width 1.8–2.3 mm.

California; Washington State.

In both male and female the third and fourth joints of the antennæ are long, slender and equal, and the joints throughout are but slightly shorter and thicker in the latter sex. The maxillary palpi are nearly as in *sericea*.

The large series before me is exceedingly heterogeneous, not only in color, but in general habitus, there being some specimens which are broad, short and strongly convex, with the prothorax large and at the base as wide as that of the elytra, and others which are comparatively narrow, elongate and depressed, with the prothorax much smaller. These differences seem to be independent of sex, and surely indicate a mixture of closely related but distinct forms, which the amount of material before me will not suffice to elucidate; especially as there is marked uniformity in the antennæ, sculpture and other structural characters throughout the series.

**I. luscitiosa** n. sp.—Rather narrowly oval, generally slightly broader behind, dull, the elytra shining, dark piceous-brown throughout, the anterior portions blackish; pubescence fine, short, moderately dense. *Head* feebly, evenly convex, very densely, rather coarsely punctate; eyes very small and unusually convex; antennæ slender, filiform, three-fifths as long as the body. *Prothorax* nearly three-fourths wider than long, the sides broadly rounded, almost straight and parallel toward base; apex about two-thirds as wide as the base, feebly arcuate; base transverse, the sinuations broad and very feeble; disk extremely densely punctate, the punctures rather coarse; basal foveæ widely impressed and feeble. *Elytra* about three times as long as the prothorax, and, at or behind the middle, nearly one-half wider, the two bases equal; apex rather abruptly but acutely rounded; disk finely but distinctly, not extremely densely punctate, without trace of impressed striæ or series except the usual two near the suture, which are fine but deep toward apex. *Abdomen* polished, very finely, rather sparsely punctate, the prosternum duller and densely, more coarsely so. *Legs* slender, moderate in length, the basal joint of the hind tarsi distinctly shorter than the remainder.

*Male*.—Third and fourth joints of the antennæ equal, each nearly twice as long as the second; eyes separated by about four times their own width.

Length 4.0–4.3 mm.; width 1.7–2.0 mm.

California (Los Angeles). National Museum.

The antennæ and maxillary palpi are nearly as in *sericea* and *variabilis*, from both of which this species is at once distinguishable



by its smaller size, coarser punctuation and much smaller, but at the same time more convex and prominent eyes.

It is represented by two specimens collected by Mr. Albert Koebele.

**I. pulla** Melsh.—Proc. Ac. Phil., III, p. 60.—Elliptical, convex, the elytra generally slightly wider behind, piceous-black throughout, the tarsi and sometimes the tibiae, prosternum and a feebly marked narrow sutural line slightly testaceous; surface slightly shining, the pubescence very short and dense. *Head* finely, very densely punctate, the surface almost flat; eyes rather small; antennae slender, about one-half as long as the body, the third and fourth joints subequal in both sexes. *Prothorax* about three-fourths wider than long, strongly narrowed from base to apex, the sides almost evenly arcuate; apex scarcely more than one-half as wide as the base, feebly arcuate; base transverse, scarcely visibly arcuate toward the middle, the angles right, not distinctly rounded; disk very vaguely and broadly impressed along the middle, sometimes only near the base, the punctures fine but deep, distinct, and almost in mutual contact; basal foveae very feeble, short and extending slightly along the basal margin. *Elytra* but slightly more than three times as long as the prothorax, and, behind the middle, nearly two-fifths wider, at base equal in width to the thoracic base; apex moderately acute; disk punctured and with subsutural striae nearly as in *sericea*, the punctures slightly coarser and a little sparser. Under surface rather shining, the abdomen very minutely, feebly and somewhat sparsely punctate. *Legs* nearly as in *sericea* but rather shorter.

*Male*.—Eyes separated by about three times their own width.

Length 4.9–5.3 mm.; width 2.1–2.3 mm.

Rhode Island; North Carolina.

The terminal joint of the maxillary palpus is rather short and robust, much less than twice as long as the penultimate, with the inner side nearly three-fourths as long as the outer. In this respect, as well as in the much smaller eyes, the present species is intermediate between *sericea* and *quadristriata*.

The antennae do not differ greatly in the sexes, and are distinctly shorter and a little thicker than in *sericea*. As in nearly all the darker species the entire body is frequently paler from immaturity.

This species makes the nearest approach to the European *murina*, but has the pronotal punctuation distinctly coarser and less dense; in fact we have no species in which the punctuation of this part is so excessively fine and densely crowded as in *murina*.

**I. quadristriata** Coup.—The Canad. Nat., 1865, p. 62; *velutina* Lec.: N. Spec. Col., 1866, p. 139.—Rather broadly oval, strongly convex and shining, pale rufo-testaceous throughout, the anterior portions, antennae or the

entire body sometimes darker, piceous; pubescence extremely short and rather sparse. *Head* feebly, evenly convex, densely punctate, rather shining; eyes small; antennæ filiform, about one-half as long as the body, with the third and fourth joints elongate and equal in both sexes. *Prothorax* nearly twice as wide as long, the apex rather wide, fully two-thirds as wide as the base, feebly arcuate; base transverse, very broadly and feebly arcuate toward the middle; sides rounded toward base, convergent and straighter toward apex; basal angles slightly obtuse and narrowly rounded; disk finely, deeply and more or less densely punctate, the interspaces sometimes nearly as wide as the punctures; basal foveæ almost completely obsolete. *Elytra* four times as long as the prothorax, near the middle about one-fourth wider, rather abruptly and narrowly rounded at apex; disk finely and deeply but quite sparsely punctate, with only the vaguest traces of impressed striæ except the two sutural, which become very pronounced toward apex. Under surface polished and rather sparsely, finely punctate throughout. *Legs* moderate in length, slender, nearly as in *sericea*.

*Male*.—Eyes separated by nearly three times their width, not appreciably differing in the female.

Length 5.0–5.8 mm.; width 2.1–2.8 mm.

Canada; Lake Superior; North Carolina.

A widely diffused and common northern species, distinguishable by its rather sparse punctuation and the sides of the prothorax more strongly rounded toward base, so that in some specimens the disk is distinctly widest before the base. The male is notably narrower than the female. The terminal joint of the maxillary palpi is broad, and the outer side is scarcely longer than the apex.

The single male which I took in North Carolina is decidedly shorter and broader than another male taken in Rhode Island, and the sides of the prothorax near the base much less rounded, in fact almost straight and parallel; it may possibly be a variety.

The disk of the prothorax is less convex toward the sides than in the species allied to *sericea*, and there are generally two feebly impressed discal foveæ and a feeble median impression near the base.

**I. monticola** n. sp.—Elongate-oval, moderately convex, dark piceous-brown throughout and shining, the prothorax more rufous; pubescence very short, comparatively sparse on the elytra. *Head* small, not one-half as wide as the prothorax, broadly impressed near the epistoma, finely but strongly punctate, the punctures slightly separated; eyes small, separated by fully three times their width in the female; antennæ long, very slender, the third joint four-fifths as long as the fourth. *Prothorax* about four-fifths wider than long, broadly but distinctly arcuate at apex, the curvature nearly continuous posteriorly along the sides, the latter becoming parallel near the base, the basal angles not rounded; base transverse, the sinuations distinct; disk rather

strongly and densely punctate, the punctures a little larger than those of the head and quite distinctly separated; basal foveæ almost obsolete. *Elytra* nearly four times as long as the prothorax and scarcely wider than the latter, acutely ogival in apical third; sides subparallel; disk finely but strongly, quite sparsely punctate, without impressed lines or series, the two sutural however becoming very strong near the apex. *Abdomen* finely, rather sparsely punctate. *Legs* slender, the basal joint of the hind tarsi three-fourths as long as the remainder.

*Male*.—Unknown.

Length 7.0 mm.; width 2.9 mm.

California (Lake Tahoe).

This species is distinct in facies, resembling only *oblongula* in this respect. It differs however from *oblongula* in many characters besides those mentioned in the table, as may be inferred from the description. The single specimen appears to be a female, although it is impossible to state this definitely without dissection. From *quadristriata* it differs in its more elongate form, larger prothorax, which is much more nearly equal in width to the elytra, and in the shorter third joint of the antennæ.

**I. oblongula** n. sp.—Oblong, rather elongate and subparallel, convex, blackish piceous throughout, the legs and antennæ concolorous; tarsi slightly paler; suture feebly, narrowly rufescent; pubescence very short, dense, pale and conspicuous. *Head* feebly convex, finely, densely punctate, the punctures distinctly separated; eyes large; antennæ very slender, filiform, rather more than one-half as long as the body. *Prothorax* fully three-fourths wider than long, the apex subtruncate, scarcely two-thirds as wide as the base, the latter transverse, the lateral sinuations broad and almost obsolete; basal angles very slightly obtuse, not rounded; sides broadly arcuate throughout, more strongly so and convergent anteriorly; disk slightly wider at basal third than at base; convex, finely, extremely densely punctate, very feebly impressed in the middle near the base, the basal foveæ widely, feebly impressed and inconspicuous. *Elytra* fully four times as long as the prothorax, and, at the middle, about one-third wider, ogival at apex; humeri slightly and arcuately oblique externally, not at all exposed at base; sides very feebly arcuate; disk with rather distinct but very feebly impressed lines throughout the width, finely, densely punctate, without punctured series. *Abdomen* minutely, somewhat densely punctate, polished; propleuræ very sparsely so externally. *Legs* long and slender, normal.

*Male*.—Unknown.

Length 6.8 mm.; width 2.7 mm.

New York (Buffalo).

The single specimen is a female, and has the third joint of the antennæ twice as long as the second and three-fourths as long as

the fourth. The eyes are separated by scarcely one-third more than their own width. The fourth joint of the maxillary palpi is rather robust, the inner and outer sides making an angle at the base of nearly ninety degrees, the former about one-half as long as the latter, the outer side but slightly longer than the apex which is feebly arcuate.

There is no species here described which is closely allied to this, but the form of the maxillary palpi shows that it should be placed in the neighborhood of *quadristriata*.

**I. valida** Schz.—Pr. Am. Phil. Soc., XVII, 1878, p. 370.—Evenly elliptical, convex, shining, dark rufo-testaceous throughout; pubescence fine, rather short and dense. *Head* small, much less than one-half as wide as the prothorax, feebly convex, broadly impressed at the base of the epistoma, finely and not very densely punctate, the punctures separated by nearly their own widths; eyes very large; antennæ long and slender, filiform, nearly two-thirds as long as the body, with the third and fourth joints elongate and equal. *Prothorax* strongly narrowed from base to apex, about twice as wide as long; sides evenly rounded; apex three-fifths as wide as the base, feebly arcuate; base transverse, the sinuations extremely feeble; basal angles right, not distinctly rounded; disk finely but deeply punctate, the punctures distinctly separated, feebly impressed just before the scutellum; basal foveæ almost obsolete. *Elytra* nearly four times as long as the prothorax, and, at the middle, about one-fourth wider, gradually and rather acutely rounded behind, disk rather finely, densely punctate, with series of almost similar punctures which are completely unimpressed, except the two or three sutural toward apex. *Abdomen* finely, densely punctate; metasternum very sparsely so; propleuræ and prosternum again more densely so. *Legs* slender, the first joint of the hind tarsi very nearly as long as the remainder.

*Male*.—Eyes separated by scarcely two-thirds of their own width; fifth ventral segment but slightly longer than the fourth, scarcely more sparsely punctate, broadly subtruncate at apex and not impressed.

Length 7.0 mm.; width 3.3 mm.

Florida.

The terminal joint of the maxillary palpi is moderately wide, with the inner side but slightly more than one-half as long as the outer, the latter distinctly longer than the apex, the apical angle distinctly rounded.

This is one of the few tropical types which extend into our fauna from Central America, where they constitute a characteristic element of the genus. It is readily distinguishable by its unusually large eyes and completely unimpressed elytral series.



**I. texana** n. sp.—Oblong, the sides nearly straight and parallel in middle two-thirds, pale ochreous-testaceous throughout, rather shining; pubescence fine and dense. *Head* moderate in size, nearly one-half as wide as the prothorax, feebly convex, impressed at the base of the epistoma, finely and not very densely punctate; eyes large; antennæ very long and slender, filiform, two-thirds as long as the body, third and fourth joints slender, equal. *Prothorax* a little less than twice as wide as long, strongly narrowed from base to apex; sides strongly, almost evenly rounded, almost parallel in basal third; apex truncate, three-fifths as wide as the base, the latter transverse, the sinuation, on each side of the rather narrow median lobe, feeble but distinct; basal angles right, narrowly rounded; disk strongly convex, finely, densely punctate, the punctures slightly separated; basal foveæ almost obsolete. *Elytra* about three and one-half times as long as the prothorax, and, at the middle, not appreciably wider, rather abruptly, strongly rounded behind; disk comparatively coarsely, very densely punctate, with series of nearly similar close-set punctures, the series feebly impressed, especially strongly so toward apex throughout the width. *Abdomen* finely, rather sparsely punctate, the metasternum extremely sparsely, rather coarsely so, the propleuræ polished, finely, sparsely punctate throughout. *Legs* slender, the basal joint of the hind tarsi distinctly shorter than the remainder.

*Male*.—Eyes separated by their own width; fifth ventral segment nearly as in *valida*, but rather more rounded behind.

Length 7.7 mm., width 3.1 mm.

Texas.

This species is allied to *valida*, but easily distinguishable by its more oblong parallel form, longer prothorax, larger head, smaller and more distant eyes, more distinctly impressed elytral series, and more sparsely punctate abdomen.

The maxillary palpi are nearly as in *valida*, the last joint about twice as long, but scarcely twice as wide as the penultimate, the outer side about one-fourth longer than the apex, the inner side a little more than one-half as long as the outer.

### **TEDINUS** n. gen.

Mandibles distinctly notched at apex, the lobes subequal. Antennæ slender, filiform, the third joint shorter than the fourth, less conspicuously so in the female. Maxillary palpi with the fourth joint as in *Isomira*, rather slender, the angle at the base less than right, the inner side much shorter than the apex, the latter longer and more oblique in the male than in the female. Labial palpi with the third joint one-half longer than wide, the apex truncate, the truncation just visibly oblique. Anterior coxæ separated by a distinct longitudinally convex prosternal process, which attains the level of the coxal apices, very declivous behind. Tarsi not as long as the tibiæ, the basal joint of the posterior elongate, the anterior distinctly dilated in the male; ungues

moderate in length, very slender, the external side feebly, evenly arcuate, the internal pectinate in apical two-thirds, the denticles very fine, short, five or six in number. Genital armature of the male deeply bilobed.

This genus while more closely allied to *Isomira* than to any other here noticed, possesses also many elements suggestive of *Capnochroa* and *Andrimus*, especially the general form of the body, and the dilated anterior tarsi of the male. The coarser sculpture of the upper surface and slightly exposed humeri, are also characters reminding us of *Andrimus*, while the form of the head and tendency to obliteration of the elytral striæ are characteristic of *Isomira*. The genital armature of the male is similar to that of the latter genus.

I have seen only a single species which may be defined as follows :

**T. angustus** n. sp.—Elongate-oval, rather convex, polished and pale brownish-castaneous throughout; pubescence short, coarse, subrecumbent, with a few short erect hairs especially toward apex, not dense. *Head* somewhat finely but deeply, moderately densely punctate; eyes rather small; antennæ slender and filiform in both sexes, the joints slightly shorter and more obconical in the female than in the male. *Prothorax* one-half wider than long, the apex subtruncate, just visibly arcuate, two-thirds as wide as the base, the latter transverse, the sinuations broad and extremely feeble; angles right not at all blunt; sides broadly arcuate anteriorly, becoming nearly parallel and straight in more than basal half; disk feebly convex, quite coarsely, deeply and densely punctate, with an elongate-oval impression just before the scutellum; basal foveæ broad but distinct. *Elytra* about four times as long as the prothorax and one-fourth wider, feebly dehiscent very near the apex, gradually, acutely ogival behind; sides parallel and nearly straight in basal two-thirds; humeri obliquely rounded externally to the prothorax; disk with series of small approximate punctures, which are obliterated and confused with those of the intervals except toward the suture, the series extremely feebly impressed externally but deeply so throughout the length near the suture; intervals coarsely, confusedly and rather densely punctate, the punctures as large as those of the series. *Abdomen* minutely, rather sparsely punctate. *Legs* rather short and robust, the basal joint of the hind tarsi nearly as long as the remainder.

*Male*.—Eyes separated by one-half more than their own width; antennæ three-fifths as long as the body, the third joint short, less than two-thirds as long as the fourth; anterior tarsi distinctly dilated, the intermediate subdilated; fifth ventral segment truncate at apex, the truncation broadly, feebly sinuate throughout; genital armature deeply bilobed, the lobes sparsely setose.

*Female*.—Eyes separated by three-fourths more than their own width; antennæ one-half as long as the body, the third joint fully three-fourths as long as the fourth; anterior tarsi simple; genital armature not visible in the type.

Length 5.5–6.0 mm.; width 2.0–2.1 mm.

Georgia (St. Catharine Island). National Museum.

Easily known by its elongate narrow form, coarse punctuation and pubescence, and indistinct elytral series toward the sides. Two specimens.

**ANDRIMUS** n. gen.

*Cteniopus* Lec. nec Sol.

The principal characters of this genus may be stated as follows:—

Front not noticeably prolonged. Antennæ differing in the sexes, much longer, more broadly compressed, and with the joints more strongly oboconical in the male, filiform in the female, the third joint much shorter than the fourth in both sexes. Eyes moderate in size, but convex and prominent, the inner margin very broadly rounded. Maxillary palpi with the fourth joint rather slender, the angle at the base much less than right, the inner side distinctly shorter than the apex, slightly more robust in the male, with the apex longer and sometimes nearly as long as the outer side. Labial palpi with the third joint slender, twice as long as wide, the apex truncate and but slightly oblique. Mandibles truncate at apex, the truncation slightly oblique and very obsoletely, broadly emarginate, the upper lobe twice as wide as the lower, longer and more advanced. Anterior coxæ separated by a process similar to that of *Cistela* but a little narrower, the posterior separated by a slender acute abdominal process. Legs rather short, the tarsi shorter than the tibiæ, the anterior feebly dilated in the male; unguis rather long and slender, with five or six denticles in apical two-thirds only, the basal third not pectinate. Genital armature distinct in both sexes, broadly sinuato-truncate at apex in the male, more narrowly and deeply sinuate in the middle in the female.

In the form of the mandibular apices this genus is intermediate between *Cistela* and *Androchirus*, but differs from both in the much feebler emargination. In its slightly dilated anterior tarsi of the male it is between *Capnochroa* and *Tedinus*. In the form of body in many of the species, which is oblong-oval, subparallel and but feebly convex in a longitudinal direction, in the aspect of the head, and in the general nature of the sculpture and vestiture it strongly resembles *Mycetochara*.

The elytra are generally abruptly wider at base than the prothorax, and are gradually, narrowly dehiscent toward apex from near the middle; the surface is striato-punctate and the pubescence is quite peculiar, consisting of longer erect hairs, with others that are shorter and more recumbent. In this last character *Andrimus* differs radically from *Cistela*, but in *Capnochroa* it is feebly indicated by viewing the elytra tangentially, when the surface will be found to be sparsely strewn with short erect hairs in addition to

the ordinary subrecumbent pubescence. In the form of the genital armature this genus differs greatly from any of those allied to *Cistela*, for in the male this part is not at all bilobed, and, what is still more exceptional in the family, it is more strongly sinuate at apex in the female than in the male; it is almost equally exposed and prominent in both sexes.

This genus differs from the European *Cteniopus* in having the anterior coxæ more widely separated, in the short third antennal joint, in its unextended front, and in the longer basal joint of the hind tarsi.

*Andrimus* will probably prove to be a moderately large genus in our Gulf States, but the species are rather closely allied among themselves, and may be difficult to discriminate from description, especially as there is nearly always more plasticity and specific variability in the genera with non-lobed tarsi, than in the others. The material which I have examined indicates five species, apparently without much doubt; these may be distinguished by the following characters:—

Basal angles of the prothorax prominent laterally.....**murrayi**  
Basal angles not prominent.

Humeri very narrowly exposed at base.....**brunneus**  
Humeri widely exposed at base.

Basal pronotal foveæ almost obsolete .....**concolor**

Basal foveæ small but deep and distinct.

Eyes in the male separated by their own width .....**nigrescens**

Eyes in the male separated by distinctly less than their own width.

**convergens**

**A. murrayi** Lec.—New Spec. Col., 1866, p. 141 (*Cteniopus*).—Oblong-oval, shining and rather pale piceous-brown throughout; pubescence rather long, semi-erect and sparse on the elytra. *Head* nearly flat above, with a transversely oval, deep impression involving the base of the epistoma and margin of the front; surface rather finely but deeply, somewhat densely punctate, the punctures all distinct; eyes separated by their own width, bordered internally by a fine groove; antennæ scarcely one-half as long as the body, slender, filiform, the third joint much more than twice as long as the second and fully three-fourths as long as the fourth. *Prothorax* three-fifths wider than long, rather campanulate in form, the basal angles right but distinctly prominent laterally, the sides before them at first feebly sinuate then nearly straight and parallel to anterior two-fifths, then strongly rounded to the apex which is truncate and two-thirds as wide as the base, the latter transverse, the sinuations rather narrow and feeble; disk almost evenly convex, finely, sparsely punctate, with a narrow impunctate median line; basal foveæ small



but distinct. *Elytra* between four and five times as long as the prothorax, and, at the middle, about one-half wider, strongly dehiscent in apical third, ogival at apex; sides parallel, feebly arcuate, the humeri strongly rounded to the base of the prothorax and somewhat widely exposed; disk with series of rather small, close-set punctures, the rows almost completely unimpressed, except feebly near the suture; intervals finely, sparsely, confusedly punctate. *Abdomen* minutely, extremely sparsely punctate. *Legs* rather short and moderately slender, the tarsi all much shorter than the tibiæ, the basal joint of the posterior a little shorter than the remainder. Length 9.8 mm.; width 3.7 mm.

Florida. Cab. LeConte.

The description is taken from the unique female type, and I have seen no other specimen which can be placed with it.

The lateral prominence of the basal angles of the prothorax is a character which is probably quite variable in degree, and has been noticed by Champion in one of the Central American species of *Lobopoda*.

The type is the largest specimen of the genus which I have seen. The genital armature is narrowly and rather deeply sinuate in the middle at apex, the sinus and apices being about equal in curvature. The fifth ventral segment has, near the apex, a deep transversely oval, abruptly limited excavation.

**A. brunneus** n. sp.—Brown, polished throughout, strongly convex, sparsely pubescent. *Prothorax* from one-third (male) to one-half (female) wider than long, the sides parallel and straight in basal two-thirds, then rounded to the apex; disk evenly convex, finely but deeply, rather sparsely punctate, without an impunctate median line except near the base; basal foveæ almost completely obsolete.

*Male*.—*Elytra* four times as long as the prothorax, and, in the middle, about one-third wider, the humeri very narrowly exposed at base; eyes separated by their own width; antennæ two-thirds as long as the body, the joints rather strongly obconical, a little more than twice as long as wide, the third one-half longer than wide and about one-half as long as the fourth; anterior tarsi quite distinctly dilated, subequal in length to the tibiæ, the basal joint nearly as long as the next two combined; fifth ventral segment short and broad, not longer than the fourth, very broadly, evenly rounded at apex, the surface not at all impressed; genital armature finely punctate, broadly truncate at apex, the truncation broadly, very feebly, evenly sinuate throughout, the angles obtuse and distinct but slightly rounded; intromittent organ long and very slender.

*Female*.—*Elytra* distinctly more than four times as long as the prothorax, and, behind the middle, nearly one-half wider, the humeri very narrowly exposed at base; eyes separated by slightly more than their own width; antennæ rather more than one-half as long as the body, slender and filiform,

the third joint nearly twice as long as wide and three-fifths as long as the fourth; anterior tarsi slender, much shorter than the tibiae; fifth ventral segment short, broadly arcuate at apex, the surface broadly, indefinitely impressed; genital armature sinuate at apex, the lateral angles broadly rounded.

Length 7.3–8.5 mm.; width 2.6–3.2 mm.

Florida (Haulover). Mr. Schwarz. National Museum.

When compared with the female of *murrayi*, the corresponding sex of this species differs in its longer antennae with shorter third joint, in the less exposed elytral humeri, in the widely diffused impression of the fifth ventral segment, in the broader, feebler median sinuation of the genital armature, and in its smaller size. The elytra of *murrayi* are more strongly dehiscent toward apex, and have the sides parallel, so that they are widest at about the middle, while in the present species they are subinflated behind the middle, the sides being more convergent toward base.

**A. concolor** n. sp.—Oblong-oval, rather strongly depressed, brown and polished throughout; pubescence sparse.

*Female*.—Head rather strongly and densely punctate, with a distinct median longitudinal sulcation; eyes moderate, separated by fully two-fifths more than their own width; antennae scarcely one-half as long as the body, slender, filiform, the third joint but slightly longer than the second and one-half as long as the third. *Prothorax* one-half wider than long; sides parallel and nearly straight in basal three-fifths, then somewhat abruptly convergent and feebly arcuate to the truncate apex; basal sinuations very feeble, the broadly rounded median lobe more prominent posteriorly than the lateral portions; basal angles right and distinctly blunt; disk almost evenly but feebly convex, with a very imperfectly defined median impunctate line, very finely, sparsely punctate, the basal foveae almost obsolete. *Elytra* fully four times as long as the prothorax and about one-half wider, rather obtusely ogival in apical third and gradually strongly dehiscent; sides parallel and very feebly arcuate behind, straight toward base, the humeri rather broadly exposed; disk rather strongly flattened toward the suture, the first three or four striae distinctly impressed; striae punctures fine; intervals finely, unevenly and sparsely punctate. *Abdomen* very minutely, extremely sparsely punctate. *Legs* rather short, the tarsi about as long as the tibiae; basal joint of the posterior quite distinctly shorter than the remainder. Fifth ventral segment short, broadly, indefinitely but strongly impressed; genital armature sinuate in the middle, nearly as in *brunneus*.

Length 8.5 mm.; width 2.9 mm.

Georgia.

This species is distinguishable at once from *murrayi* by the very short third antennal joint of the female, and from *brunneus* by its much narrower, more depressed form and smaller eyes of the same

sex. There is before me a male which should apparently be associated with the female type above described, being depressed and nearly similar in size and outline. The pronotum of this specimen is strongly alutaceous and dull, and has two extremely large and deep discal foveæ, probably of an accidental nature; the antennæ are but slightly more than one-half as long as the body, but stout, compressed, with the joints much more strongly obconical, the third joint scarcely one-half as long as the fourth.

**A. nigrescens** n. sp.—Oblong-oval, rather strongly convex, piceous-black throughout, the antennæ black; tarsi rufescent; integuments shining; pubescence sparse.

*Male*.—Head rather finely but deeply, very densely punctate; eyes prominent, separated by their own width; antennæ long, stout, strongly compressed, fully two-thirds as long as the body and subequal in length to the elytra, joints strongly obconical, scarcely more than twice as long as wide, the third a little longer than wide and less than one-half as long as the fourth. *Prothorax* rather long and subquadrate, one-third wider than long; sides parallel and straight in basal two-thirds, then evenly, strongly rounded to the truncate apex; base transverse, the sinuations narrow and feeble; basal angles right, blunt; disk rather convex, finely punctate, the punctures sparse but denser toward the middle anteriorly, with a feeble impunctate line toward base; basal foveæ small and distinct. *Elytra* unusually short, twice as long as wide, one-half wider and not quite four times longer than the prothorax, narrowly, gradually dehiscent from the middle, the sides in basal two-thirds parallel and feebly arcuate; humeri broadly exposed at base; disk with rows of rather small punctures, deep and conspicuous except toward the sides, where they become very fine, the striæ more or less strongly impressed throughout the width; intervals finely, confusedly and not very sparsely punctate. *Abdomen* wanting in the type. *Legs* rather short, the anterior tarsi dilated, the posterior scarcely three-fourths as long as the tibiæ, with the basal joint much shorter than the remainder. Length 8.0 mm.; width 3.0 mm.

Florida. Mr. Jülich.

The principal differences between this species and the male of *brunneus* reside in the broader, relatively longer and more compressed antennæ, which are black in *nigrescens* and pale brown in *brunneus*, in the broader, relatively shorter elytra and much shorter tarsi. In the male of *brunneus* the hind tarsi are very nearly as long as the tibiæ. From the male of *concolor* it differs in its convex form and much longer antennæ. With the female type of *murrayi* it has very little in common.

**A. convergens** n. sp.—Rather slender, moderately convex, piceous; legs and elytra dark brown; integuments polished throughout; pubescence sparse.

*Male*.—Head somewhat concave between the eyes, rather coarsely, sparsely and unevenly punctate; eyes somewhat large, separated by three-fourths of their own width; antennæ moderately stout and very feebly compressed, two-thirds as long as the body, the joints distinctly more than twice as long as wide, the third one-half as long as the fourth. *Prothorax* scarcely one-half wider than long, slightly wider at anterior third than at base, the sides from that point feebly convergent and straight to the basal angles, the latter right and narrowly rounded; base transverse and straight in middle half, feebly posteriorly oblique laterally; apex truncate, two-thirds as wide as the base, the sides in apical third rather strongly convergent and feebly arcuate; disk rather finely, sparsely, somewhat unevenly punctate, with an impunctate median line; basal foveæ small but deep and very conspicuous. *Elytra* two-fifths wider than the prothorax and rather more than four times as long; sides parallel; humeri rather broadly exposed at base; disk punctate and striate as in *concolor*. *Abdomen* minutely and very sparsely punctate throughout. *Legs* somewhat short; all the tarsi distinctly shorter than the tibiæ, the anterior subdilated, the basal joint of the posterior two-thirds as long as the remainder. Fifth ventral segment but slightly longer than the fourth; broadly rounded behind, the genital armature broadly sinuato-truncate at apex. Length 7.3 mm.; width 2.5 mm.

#### New York.

The specimen before me is labeled as above, but there is more or less doubt concerning such a northern habitat. The species is quite distinct from the others in the decidedly larger eyes of the male, and the sides of the prothorax convergent and straight from before the middle to the base, also in its minute but unusually deep basal foveæ of the pronotum.

#### CAPNOCHROA Lec.

This is also an exclusively American genus, and is represented in our fauna as far as known by a single large and interesting species. It is not very closely related to *Cistela*, although the mandibles are notched at apex and subequally bilobed as in that genus. The sexual characters differ greatly, and the anterior tarsi instead of being strongly compressed and distorted—when modified at all in the male—are here long and slender, and feebly flattened or just visibly dilated, with the basal joint as long as the next two together, in this character approaching *Andrimus* (*Cteniopus* Lec.) and *Tedinus*.

In the great development of the lobes of the male genital armature, it resembles *Androchirus* and differs completely from *Andrimus*. The unusually composite nature of *Capnochroa* will therefore be recognized at once.



The maxillary palpi differ somewhat conspicuously in the sexes, the fourth joint being more elongate in the male, with the inner side much shorter than the apex; in the female the inner side is subequal to the apex. Less marked sexual differences in the palpi are observable also in some other genera, such as *Isomira* and the European *Cteniopus*, this character apparently being especially developed in the genera with simple tarsi.

Some of the Central American species assigned to *Cistela* by Mr. Champion, are said to have the anterior tarsi more or less dilated, and these may possibly find a more fitting place as a separate genus allied to the present one, but differing in the serrate antennæ. *Cistela fragilicornis* should, almost undoubtedly, be placed in *Capnochroa*.

**C. fuliginosa** Melsh.—Proc. Ac. Phil., III, 1846, p. 59.—Elongate-elliptical, strongly, very gradually pointed behind, moderately convex, dark piceo-castaneous throughout, dull, the elytra polished; pubescence extremely short, dense on the pronotum, sparse on the elytra. *Head* finely, rather densely punctured, the eyes moderate; antennæ long, rather slender, feebly compressed, filiform. *Prothorax* from three-fourths wider, to nearly twice as wide as long, the apex less than one-half as wide as the base, truncate; base transverse, broadly, rather feebly bisinuate, the basal angles right; sides parallel and nearly straight in basal half, then very strongly convergent and broadly arcuate to the apex; disk very feebly convex, more or less explanate laterally, very finely but strongly, densely punctate, the punctures distinctly but narrowly separated; basal foveæ small but distinct. *Elytra* feebly, gradually dehiscant toward apex, rather more than four times as long as the prothorax, and, in the middle, quite distinctly wider, very gradually acute behind, each elytron narrowly rounded at tip; sides broadly, feebly arcuate, the humeri obliquely rounded to the base of the prothorax; disk with fine, deeply impressed series of moderately fine distinct punctures, the intervals convex, minutely and not very closely, confusedly punctate. *Abdomen* polished, minutely, rather sparsely punctate, somewhat more closely so toward the middle in the male. *Legs* and tarsi long, very slender in both sexes, the basal joint of the posterior as long as the remainder.

*Male*.—Eyes separated by just visibly less than their own width; antennæ two-thirds as long as the body, the fourth joint fully twice as long as the two preceding together, third slightly longer than wide; anterior tarsi longer than the tibiae, extremely feebly dilated, densely clothed beneath with short flavate hairs which bristle laterally in the form of fimbriae; fifth segment with a rather small median sinuation which is much wider than deep, the edge bordering it strongly inflexed; genital armature deeply bilobed, the lobes large, long, flattened, slightly twisted but not bent downward, excavated along their inner face, their apices rounded.

*Female*.—Broader than the male, less acute behind; eyes separated by one-third more than their own width; antennæ one-half as long as the body, the third joint more than twice as long as the second and two-thirds as long as the fourth; anterior tarsi slender, not quite as long as the tibiæ; fifth ventral segment broadly impressed, the apex very feebly, narrowly sinuate, the genital armature truncate at apex, with the angles broadly rounded.

Length 10.0–12.0 mm.; width 3.9–4.7 mm. ♂ ♀.

New York; Virginia.

This species is rather abundant and apparently not subject to great variation.

### CISTELA Fab.

*Chromatia* Lec.—Sm. Misc. Coll., III, p. 244.

This genus is at present quite composite, but the species here referred to it agree in having the antennæ more or less compressed, always distinctly serrate internally, with the third joint very short in both sexes, but decidedly longer in the female than in the male, and the fourth joint of the maxillary palpi somewhat slender, with the angle at the base less than right.

The genital armature is more or less truncate or feebly sinuate in the female, as is usually the case throughout the family, and is deeply bilobed in the male, the two lobes sublunate and long, but scarcely attaining the development or densely corneous structure seen in *Capnochroa* and *Androchirus*.

The punctuation and pubescence as a rule are extremely dense, the latter very short and more or less inconspicuous; the punctures are, however, much sparser in the aberrant *amæna*. The latter species forms the type of the genus *Chromatia* of LeConte, but the difference in the form and prominence of the genital armature, "the sixth ventral segment being prominent and deeply excavated in the male," upon which it was separated, does not of itself appear to be sufficiently decisive.<sup>1</sup> It is quite true that *amæna* differs greatly from *brevis* in general facies and sculpture, but *marginata* is a satisfactory intermediate in many of its characters in spite of its much larger size, and it does not seem proper to admit the generic validity of *amæna* without granting that of *marginata* and also the Central American *nigricornis*, a specimen of which is before me,

<sup>1</sup> Note the extraordinary diversity in the male sexual characters of this genus as exemplified by *C. brevis* and the closely related *C. theveneti*.

and which is more closely allied to *amœna* than to any species of the *brevis* group.

Our species are comparatively few in number and may be distinguished by the following table:—

Form oval or elliptical, rather strongly convex, the sides of the elytra more or less evenly continuous with those of the prothorax.

Femora red.

Broadly oval, the punctuation excessively minute; antennæ in the male distinctly shorter than the body.....**brevis**

Narrowly oval, the punctuation not so minute and quite distinct on the head and pronotum under low power; male antennæ nearly as long as the entire body.....**theveneti**

Femora black.

Third antennal joint of the female three times as long as the second; prothorax nearly twice as wide as long.....**pinguis**

Third joint in the female barely twice as long as the second; prothorax distinctly less than twice as wide as long.....**opaca**

Form oblong or oblong-elongate, the sides of the elytra straighter and not evenly continuous with those of the prothorax.

Large species, the antennæ long and unusually slender; prothorax much less than twice as wide as long.....**marginata**

Smaller species; antennæ very stout, shorter, strongly compressed; prothorax short, more than twice as wide as long; punctuation of the upper surface unusually sparse.....**amœna**

**C. brevis** Say.—Journ. Ac. Phil., III, 1823, p. 269; *erythroptera* Ziegl.: Proc. Ac. Phil., II, 1844, p. 46; *rufipes* Melsh.: Cat. No. 518.—Elliptical, rather strongly convex, feebly shining, alutaceous; black throughout, the legs and sometimes the entire elytra pale rufo-ferruginous; entire upper surface excessively minutely, densely punctate. *Head* narrowly impressed along the middle; eyes moderate; antennæ stout, strongly serrate internally. *Prothorax* rather large, one-half to two-thirds wider than long; apex truncate, one-half as wide as the base, the latter transverse, broadly, strongly bisinuate; sides strongly convergent from base to apex, broadly, evenly arcuate; disk unimpressed in the middle. *Elytra* nearly four times as long as the prothorax, and, in the middle, quite distinctly wider, the sides very feebly arcuate and subcontinuous with those of the prothorax, the humeral callus not quite as prominent laterally as in *pinguis*; disk finely but deeply striate, the striæ finely but rather distinctly punctate; intervals broadly, very feebly convex. *Abdomen* shining, finely, rather densely punctate. *Legs* slender, the basal joint of the hind tarsi as long as the remainder.

*Male*.—Eyes separated by slightly but distinctly more than their own width; antennæ three-fourths as long as the body, joints nearly three times as long as wide, third very short, not quite as long as wide, oblique at apex, fourth twice as long as the two preceding together; anterior tarsi compressed, compact, the fifth joint thickened toward base, strongly bent; fifth ventral segment

with a large deep angulate emargination, extending almost to the base of the segment, the anterior half of the emargination filled with a depressed concave coriaceous plate, which is broadly sinuate posteriorly; supplementary segment deeply bilobed.

*Female*.—Eyes separated by nearly one-half more than their own width; antennæ one-half as long as the body, the joints scarcely more than twice as long as wide, the third twice as long as the second, much longer than wide and one-half as long as the fourth; anterior tarsi normal, slender; fifth ventral segment entire, sparsely punctate, broadly feebly impressed in the middle.

Length 7.5–9.0 mm.; width 3.3–4.4 mm.

Pennsylvania; Virginia; Indiana.

The longitudinal convexity of this species is rather greater than usual, and the punctuation is much more minute than in any other of our species. It will be noticed that the male modification of the anterior tarsi is of precisely the same nature as that of *Androchirus*. The occasionally pale elytra of this species is a character similar to that observed in *Agriotes fucosus*; it does not depend in any way upon the sex of the individual.

**C. theveneti** Horn.—Trans. Am. Ent. Soc., Sept., 1875, p. 156.—Elongate-oval, rather strongly convex, piceous-black; femora red, the tibiæ and tarsi infusate; lustre dull. *Head* very small, flattened above, finely but strongly, extremely densely punctate, the punctures in mutual contact; eyes very small, separated in the male by distinctly more than twice their width; antennæ in the male nearly as long as the body, the fourth joint almost twice as long as the two preceding together, much shorter in the female, with the fourth joint just visibly longer than the two preceding combined. *Prothorax* about one-half wider than long, the sides broadly, evenly arcuate, strongly convergent from base to apex, the latter narrow and truncate; base transverse, broadly, distinctly bisinuate; disk finely, excessively densely punctate, the punctures closely crowded, the lustre dull. *Elytra* scarcely more than three times as long as the prothorax, and, in the middle, but slightly wider; sides parallel, feebly arcuate, continuous in curvature with those of the prothorax; disk finely, distinctly striate, the striæ not very coarsely or closely punctate, the intervals feebly convex, minutely, extremely densely punctate. *Abdomen* more shining, finely, feebly, rather densely punctate. *Legs* slender, the basal joint of the hind tarsi four-fifths as long as the remainder. Length 6.5–8.5 mm.; width 2.7–3.4 mm.

California (Sierras).

Easily distinguishable by its narrow convex form and bright red femora, as well as the unusually elongate male antennæ. The elytral intervals appear to be much more strongly convex in the male than in the female; in the latter sex they are quite flat.

This species differs remarkably from *brevis* in the male sexual



characters, the fifth segment in that sex being obtusely subangulate at apex, without the slightest trace of the emargination which is so extremely developed in *brevis*. There can be no doubt that the specimen before me is a male, as the intromittent organ is well protruded and the genital armature is deeply bilobed, the lobes acute and tufted with coarse setæ at apex. This abrupt and radical difference in the nature of the male sexual modification in two species otherwise so similar, is quite unexpected. The anterior tarsus in the male of *theveneti* is normal and not at all modified, with the basal joint fully one-half as long as the remainder.

**C. pinguis** Lec.—Smith. Cont. Knowl., XI, 1859, p. 16 (*Xystropus*).—Rather robust, oval, convex, intense black throughout; lustre rather dull and strongly alutaceous. *Head* small, feebly convex, finely, densely punctate, the punctures all distinctly separated; eyes small, separated by fully twice their width; antennæ scarcely one-half as long as the body, very stout, compressed, serrate, the intermediate joints one-half longer than wide, the third three times as long as the second and three-fourths as long as the fourth. *Prothorax* short, nearly twice as wide as long, the apex truncate, fully one-half as wide as the base, the latter transverse, broadly, rather strongly bisinuate; sides convergent and rather strongly, evenly arcuate from base to apex, becoming almost parallel near the base; disk not impressed, minutely but deeply, very densely punctate, the punctures distinctly separated. *Elytra* about four times as long as the prothorax, and, in the middle, about one-third wider; sides parallel and distinctly arcuate, especially behind, subcontinuous with those of the prothorax, the humeral callus slightly longitudinally prominent; disk finely but rather strongly striate, the striæ finely but distinctly, rather closely punctured, the intervals flat, minutely, feebly, densely punctate. *Abdomen* minutely, evenly, rather closely punctured. *Legs* moderate, slender, the basal joint of the hind tarsi equal in length to the remainder. Length 8.5 mm.; width 4.0 mm.

New Mexico. Cab. LeConte.

This species which is represented only by the female is allied rather closely to *brevis*, but is distinguishable by the black legs, much shorter, more transverse prothorax and smaller eyes.

**C. opaca** Lec.—Proc. Ac. Phil., 1859, p. 78.—Elongate-oval, intense black throughout, dull and alutaceous. *Head* moderate, nearly flat above, finely, densely, deeply punctate, the punctures all distinct; eyes small, separated by twice their width; antennæ stout, compressed, strongly serrate internally, scarcely more than one-half as long as the body, the fourth joint slightly longer than the two preceding together. *Prothorax* fully two-thirds wider than long; sides strongly convergent from base to apex and strongly, evenly arcuate, the apex truncate and less than one-half as wide as the base, the latter

transverse and broadly bisinuate; disk minutely, extremely densely punctate, the punctures not in mutual contact. *Elytra* but little less than four times as long as the prothorax, and, in the middle, about one-third wider; sides arcuate and continuous with those of the prothorax; disk finely but distinctly striate, the striæ rather abruptly impressed, finely punctate, the intervals flat, minutely, very densely punctate. *Abdomen* shining, finely, more sparsely punctate. *Legs* moderate in length, very slender, the basal joint of the hind tarsi three-fourths as long as the remainder. Length 8.5–10.0 mm.; width 3.8–4.3 mm.

California (Coast mountains).

The specimens before me appear to be all females. It is distinguishable from *theveneti* by its larger size, broader form, shorter antennæ, shorter, broader prothorax and black legs.

**C. marginata** Ziegl.—Proc. Ac. Phil., II, 1844, p. 46.—Elongate-oval, rather feebly convex, piceous-black, the entire margin of the pronotum broadly, and of each elytron except the base, narrowly, prosternum and abdomen pale rufo-ferruginous; antennæ black; legs dark rufo-piceous; lustre rather dull; pubescence unusually long and distinct, pale ochreous. *Head* rather large, feebly convex, extremely minutely, rather densely punctate, the punctures separated; eyes moderate, separated by three-fourths more than their own width; antennæ long and slender, a little more than one-half as long as the body, the joints distinctly serrate internally, more than three times as long as wide, the third twice as long as the second and three-fifths as long as the fourth. *Prothorax* one-half wider than long, the apex truncate, one-half as wide as the base, the latter transverse, broadly, rather feebly bisinuate; sides evenly convergent and broadly arcuate from base to apex; disk rather strongly depressed above, feebly, narrowly canaliculate throughout along the middle, minutely, extremely densely punctate, the interspaces shining. *Elytra* fully five times as long as the prothorax, and, in the middle, fully one-half wider, gradually ogival in rather less than apical third; sides thence parallel and very nearly straight to the humeri, which are abruptly, strongly rounded to the base of the prothorax and rather broadly exposed; disk very finely, feebly striate, the striæ extremely finely, inconspicuously punctate, the punctures narrow and sublinear; intervals nearly flat, minutely, very densely punctate. *Abdomen* rather more shining, minutely, rather closely punctate. *Legs* slender, normal. Length 12.5 mm.; width 4.5 mm.

Pennsylvania. Cab. LeConte.

This species, which is represented as far as I know by the unique type, is exceedingly distinct and widely isolated from any of our other species by its finely canaliculate prothorax and long elytra, with rounded exposed humeri. It may have to be generically separated, but in the condition of knowledge of the exotic forms, this cannot now be appropriately done. The type appears to be a female.

**C. amœna** Say.—Journ. Ac. Phil., III, 1823, p. 268 (Chromatia Lec.).—Oblong-oval, rather depressed, black and polished throughout, the prothorax, under surface and legs pale rufo-testaceous; pubescence extremely short, fine, rather sparse and inconspicuous. *Head* rather strongly, longitudinally impressed in the middle toward base, minutely, strongly, rather densely punctate, the punctures distinctly separated; eyes moderate, separated by at least one-third more than their own width; antennæ very stout and compressed, rather less than one-half as long as the body, serrate, the joints distinctly longer than wide, third joint nearly twice as long as the second and rather more than one-half as long as the fourth. *Prothorax* short, transverse, rather more than twice as wide as long, the apex truncate in the middle, broadly rounded thence laterally along the sides, the latter becoming more or less feebly divergent and feebly arcuate from apical third to the basal angles, the latter right; base transverse, the sinuations very small, narrow and feeble; disk more or less explanate laterally, feebly impressed in the middle near the base and in the position of the basal foveæ, minutely and rather sparsely punctate. *Elytra* four times as long as the prothorax, and, at or behind the middle, quite distinctly wider than the latter, rather obtusely ogival at apex; sides subparallel, very feebly arcuate, not quite continuous with those of the prothorax, the humeri obliquely rounded externally; disk with rather coarse, deeply impressed striæ of distinct, close-set punctures, the intervals feebly convex, finely but strongly, densely and very distinctly punctate. *Abdomen* minutely, feebly, rather sparsely punctate; propleuræ excessively finely, sparsely so. *Legs* decidedly short, rather robust; basal joint of the hind tarsi distinctly shorter than the remainder.

*Male*.—Similar to the female in form and size; antennæ much stouter, a little more than one-half as long as the body, the joints but slightly longer than wide, the third extremely short, wider than long, similar to the second and scarcely more than one-fourth as long as the fourth; eyes separated by one-fourth more than their own width; anterior tarsi a little thickened or subdilated toward base, with the basal joint nearly as long as the next two combined; fifth ventral short, broadly truncate at apex, with a broad shallow median canaliculation which becomes wider toward apex; genital armature deeply bilobed, the lobes lamelliform, moderate in length.

Length 6.8–7.8 mm.; width 2.6–3.4 mm.

New York; Kentucky; Indiana.

The above description refers to the female. In one specimen the elytra are colored exactly as in *marginata*, each elytron being surrounded completely, except at base, with a fine testaceous margin. This species will assuredly be considered the representative of a subgenus when the entire genus can be investigated, but at present there are no better grounds for separating it than in the case of *marginata*, or the Central American *nigricornis*, the latter being quite closely allied to *amœna* in its short legs and form of the prothorax.

**ANDROCHIRUS** Lec.

A few large, strongly, longitudinally convex species alone constitute this genus, which seems to be exclusively North American. It is quite closely allied to *Cistela*, but sufficiently well distinguished by the great inequality of the mandibular lobes, long filiform antennæ, and greater posterior prolongation of the acute thoracic angles, the latter being much more marked in the female than in the male.

The legs and antennæ are long and slender. The terminal joint of the maxillary palpi is rather slender, triangular, with the very oblique apex almost as long as the outer side, approaching the usual type in *Hymenorus*, that of the labial exceedingly robust and with one of its faces deeply concave. The male sexual characters are almost perfectly homologous with those of *Cistela brevis*.

The species are unusually closely related among themselves, and I have only been able to satisfactorily distinguish two, with the possibility of a third. They may be recognized by the following characters:—

Deep black; femora rufous, the tibiæ and tarsi piceous ..... **femoralis**  
Grayish-black; legs pale luteo-testaceous throughout ..... **erythropus**

**A. femoralis** Oliv.—Ent. III, 1795, 54, p. 12.—Oblong-oval, strongly convex, entire body and antennæ black, the femora bright red, the tibiæ and tarsi brownish; lustre dull, the pubescence excessively short and dense, dark and not in the least conspicuous. *Head* and prothorax minutely but deeply, extremely densely punctate, the punctures all narrowly separated, the head somewhat flat above; eyes rather small, separated by one-half more than their own width; antennæ long, slender, filiform, the joints fully three times as long as wide, third more than twice as long as the second and three-fifths as long as the fourth. *Prothorax* scarcely one-half wider than the median length, the apex just visibly sinuate, rather less than one-half as wide as the base, the latter broadly, strongly bisinuate, the basal angles strongly produced posteriorly and very acute; sides evenly convergent from base to apex, broadly, evenly, rather strongly arcuate; disk not impressed, the basal foveæ almost obsolete. *Elytra* four times as long as the prothorax and equal in width to the latter, sometimes slightly narrower; gradually, acutely ogival at apex; sides parallel and nearly straight; disk finely but rather strongly striate, the striæ finely punctate, the intervals distinctly convex, extremely minutely, densely punctate. *Abdomen* minutely, densely punctate. *Legs* very long and slender, the anterior and intermediate tarsi longer than the tibiæ, the posterior subequal thereto; basal joint of the latter equal in length to the remainder. Length 9.0–10.0 mm.; width (of elytra) 3.3–4.0 mm. ♀.

South Carolina; Georgia; Florida.

The specimens before me are all females, and in that sex the fifth



segment is shining, extremely sparsely punctate, broadly very feebly impressed and feebly, narrowly sinuate at apex. Most of the specimens have the elytra exactly equal in width to the prothorax, but in one they are distinctly narrower throughout their length.

**A. erythropus** Kirby.—Fn. Bor. Am., IV, 1837, p. 239; *fuscipes* Melsh.: Proc. Ac. Phil., III, 1846, p. 60; *luteipes*, Lec.: Sm. Misc. Coll., VI, p. 64.—Elongate-elliptical, strongly convex, grayish-black, dull, the legs throughout pale luteo-testaceous; antennæ fuscous, paler near the base; pubescence extremely short and dense, recumbent, cinereous in color and conspicuous. *Head* and pronotum extremely minutely and densely punctate, the punctures all narrowly separated, the head flat above, finely canaliculate along the middle, the eyes small; antennæ long and filiform. *Prothorax* and elytra nearly as in *femoralis*. *Abdomen* minutely rather densely punctate, the pubescence rather more conspicuous than in *femoralis*. *Legs* slender, shorter in the female than in the male, and, in the former, much shorter than in the female of *femoralis*.

*Male*.—Eyes separated by nearly one-half more than their own width; antennæ two-thirds as long as the body, the third joint but slightly longer than the second; anterior tarsi strongly compressed, the joints compactly joined, the two basal very small and subequal, the fifth strongly bent, slightly twisted and deformed, with the claws larger; fifth ventral segment polished, scarcely punctate, deeply, widely, angularly emarginate, the emargination partially filled with a depressed membrane; lobes of the genital armature very long and conspicuous, arcuate, approaching each other and turned downward toward apex, deeply excavated along their exposed surface, corneous.

*Female*.—Broader than the male, the prothorax more transverse, the basal angles more prolonged posteriorly; eyes separated by rather more than twice their width; antennæ one-half as long as the body, the third joint more than twice as long as the second and two-thirds as long as the fourth; anterior tarsi slender, longer than the tibiæ, the basal joint as long as the next two together; fifth ventral segment almost impunctate, impressed or broadly reflexed toward apex, the latter feebly, narrowly sinuate.

Length 8.2–10.0 mm.; width 3.0–3.8 mm.

Canada; North Carolina; Indiana.

In most of the males the third antennal joint is very slightly longer than wide, but in the two North Carolina specimens it is a little longer, fully one-half longer than wide. There is absolutely no difference in the sexual characters or in the minutest details of structure other than that mentioned, and I therefore think that the proposed synonymy cannot but be correct. In one specimen the legs are clouded with a slightly darker tint from the middle of the femora to the apex.

A few females before me from New York have the punctures

throughout the upper surface decidedly sparser than in the normal forms; with the discovery of the male they may possibly be found to represent a closely allied species.

## MELOIDÆ.

### ZONITIS Fab.

*Nemognatha* Ill.; *Gnathium* Kirby.

**Z. dunniana** n. sp.—Robust, convex, subparallel, polished, glabrous, pale flavo-testaceous throughout, the antennæ except at base and the tarsi toward apex piceous-black. *Head* subtriangular, somewhat coarsely, very densely punctured anteriorly, sparsely and unevenly so behind; labrum large, as long as wide; eyes moderate, the anterior emargination distinct; antennæ very slender, filiform, one-half as long as the body in the male, much shorter in the female. *Prothorax* nearly as long as wide, just visibly and evenly decreasing in width from base to apex; sides nearly straight in the middle; base slightly wider than the apex, both equally evenly and feebly arcuate; disk rather convex, not distinctly impressed, the punctures rather small, very feeble and excessively sparse. Scutellum impunctate toward apex. *Elytra* scarcely twice as long as wide, three-fourths to four-fifths wider than the prothorax, subparallel, abruptly and broadly rounded behind; disk convex, extremely coarsely, deeply and exceedingly sparsely punctured, each with three fine feebly elevated conspicuous subcostiform lines. *Legs* rather short and stout, the outer spur of the hind tibiæ robust, compressed cylindrical and very obliquely truncate, the inner spur a little less robust but similar to the outer. Length 7.5–12.5 mm.; width 3.2–5.8 mm.

Texas (El Paso). Mr. G. W. Dunn.

Although belonging near *punctipennis* Lec., this unusually interesting and aberrant species is distinguishable at a glance by its much coarser and sparser punctures, which are fully as distant as in *immaculata* and rather larger; it is further distinguished by the remarkable disparity in size of the sexes, the male being very much larger than the female. The abdomen of the male is finely, excessively densely punctuate and dull throughout every part of its surface, while in the female it is uniformly and unusually sparsely punctuate and polished; it is thus seen—in common with *immaculata*—to be closely allied to *bilineata* and others of that group. The maxillary processes are a little less than one-half as long as the head.

**Z. perforata** n. sp.—Moderately slender, convex, shining, pale ochreous-flavate, the elytra a little darker, brownish-rufous; antennæ black except at base; legs pale, the femora at tip, tibiæ along the external edge and toward

apex, and tarsi black; pubescence fine, short, cinereous, very sparse on the elytra, denser anteriorly. *Head* triangular, distinctly dilated behind the eyes, rather coarsely, very densely punctate, a little more sparsely so behind; eyes moderate, the emargination small but distinct; antennæ filiform, nearly one-half as long as the body, third joint three times as long as wide. *Prothorax* very nearly as long as wide, the sides straight, feebly convergent from base to apex, the latter broadly, distinctly arcuate, base subtruncate; disk narrowly impressed in the middle, the canaliculation short, densely, not very coarsely punctate throughout. *Scutellum* densely punctate. *Elytra* subparallel, twice as long as wide, about one-half wider than the prothorax, obtusely ogival in apical fourth; disk coarsely, deeply, rather closely punctured, the punctures a little sparser behind the humeri. *Abdomen* finely, strongly and somewhat densely punctate. *Legs* slender, the tarsi long. Length 11.0 mm.; width 3.8 mm.

Texas (Austin).

The only specimen which I could obtain is a male, the genital armature—in this genus very prominent and segmentiform—being deeply cleft. This species should be placed near *vittigera*, but differs in its much sparser and coarser elytral punctures and shorter maxillary processes. The maxillary processes are black and bent beneath the head, but are very short, not longer than the mandibles.

**EPICAUTA** Redt.

**E. levettei** n. sp.—Slender, feebly shining, the elytra dull, black throughout, the pubescence very short, sparse, recumbent, black. *Head* large, subquadrate, broadly truncate at base, the occiput very prominent, above the level of the pronotum and concealing a considerable portion of the latter when thrown backward; surface shining, finely, rather sparsely punctured; eyes normal, feebly emarginate; antennæ extremely long and slender, in the male nearly three-fourths as long as the body, just visibly attenuate toward apex, the joints long and cylindrical, the second joint one-third as long as the third. *Prothorax* as long as wide, much shorter and narrower than the head; sides parallel in basal two-thirds, then convergent to the apex, the latter about two-thirds as wide as the base; disk feebly convex, very broadly and feebly impressed along the middle in basal half, rather shining, finely feebly and densely punctate, the punctures well separated. *Elytra* subparallel, three times as long as wide or slightly more, rather more than twice as wide as the prothorax, the surface dull, extremely minutely, strongly granulato-reticulate, very finely, evenly, somewhat closely punctate. *Abdomen* shining, finely, sparsely punctured, the pubescence long, black and semi-erect. *Legs* long and rather stout, finely, densely punctate and pubescent; spurs of the anterior tibiæ two in number in both sexes, rather short but slender, black, those of the hind tibiæ very unequal in length, the inner long and rather

slender, the outer short and somewhat more robust; tarsi very long and strongly compressed. Length 21.5–26.0 mm.; width 5.7–6.5 mm.

Colorado.

A large and conspicuous species belonging near *funebri*, but larger in size and more sparsely punctured, with a larger head and much longer antennæ. The antennæ are notably longer and more slender than in any other species, the third joint being 2.0 mm. in length in the male and 1.4 mm. in the female, the entire length in the latter sex being distinctly more than one-half that of the body. This species, which is represented before me by four specimens, is one of the most interesting of the novelties contained in the Levette cabinet.

**E. duplicata** n. sp.—Moderately robust, cuneiform, black throughout the body, legs and antennæ, completely dull above, shining beneath; pubescence cinereous and black, short, recumbent, moderately dense and extremely coarse, black on the upper portions of the disk of the head and pronotum except along the median line, each elytron narrowly cinereous along the suture and external and apical margins, and also with a median vitta which is composed of two fine vittæ widely separated throughout but fused together at base and apex, the black pubescence similar in structure to the cinereous. *Head* finely, rather densely punctate, with a small oblique polished space near the base of each antenna; eyes moderate, normal; antennæ short and rather stout, but filiform, feebly compressed, scarcely one-half longer than the head, the joints subparallel and compactly joined, the second one-half as long as the third. *Prothorax* distinctly narrower than the head, a little wider than long, widest at anterior third, finely, deeply, rather densely punctate. *Elytra* distinctly increasing in width from base to near the apex where they are about twice as wide as the prothorax, about twice as long as wide, completely concealing the abdomen; sides nearly straight; disk finely, densely punctate. Under surface sparsely clothed with cinereous pubescence, the abdomen polished, rather coarsely but sparsely punctate. *Legs* moderate; spurs of the hind tibiæ very unequal, the inner slightly shorter, rather slender and very acute, the outer robust. Length 9.0 mm.; width 3.2 mm.

Arizona (Fort Apache).

The single representative appears to be a female. This species is very isolated in many of its characters, but for the present may be placed near *sanguinicollis*. The general characteristics of vestiture and ornamentation are quite different from anything else in our fauna.



**PYROTA** Lec.

The fasciate species allied to *mylabrina* can be very readily divided into two groups depending upon the form of the last joint of the maxillary palpi, some of the species having this joint but slightly modified in the male, while in others it becomes large and much deformed. The six species known to me may be separated as follows:—

Terminal joint of the maxillary palpi in the male very large, strongly transverse.

Basal antennal joint unusually long, pale; apical fascia of the elytra obsolete.....**postica**

Basal joint short; elytra with three fasciæ.

Basal joint of the antennæ pale; femora and tibiæ flavate with the apices black.....**mylabrina**

Basal joint black; legs and entire under surface black; middle elytral fascia much more elongate, the apical one reduced to a narrow border.

**engelmanni**

Terminal joint of the maxillary palpi not greatly modified in the male, small but obliquely pyriform, rapidly pointed and attached more or less axially to the third joint which is shorter and more transverse than in the female; terminal joint in the female not oblique, slender, truncate at apex.

Basal joint of the antennæ entirely or in great part pale; elytra rather strongly punctate, the apical piceous area not attaining the apex but separated therefrom by a narrow pale border, often completely obsolete.

**punctata**

Basal joint black; elytra finely punctate, the apical piceous area much larger, always attaining the apical margin.

Elytra densely punctate and more or less dull; antennæ (male) with the third joint very slender, distinctly longer than the fourth; base of the head more or less piceous.....**terminata**

Elytra more sparsely punctate and polished; antennæ (male) with the third joint much shorter than the fourth.....**concinna**

*Mylabrina* Chev. as above defined does not occur within the limits of the United States, and the specimens heretofore so identified are resolvable into the two species defined above under the names *terminata* Lec. and *concinna*. The definition of *mylabrina* is taken from the original description of Chevrolat, in which it is stated that the terminal joint of the maxillary palpi is "fortement en hache, très-épais," which would ally it closely to *engelmanni* and *insulata*.

**P. punctata** n. sp.—Pale testaceous, the elytra still paler and more flavate; antennæ black except the basal joint; legs testaceous, the tarsi and

tips of the femora and tibiae black; under surface variegated with black and testaceous, the abdomen banded; integuments polished. *Head* immaculate, finely, sparsely punctate; eyes moderate; antennae slender, two-fifths as long as the body in the male. *Prothorax* slightly elongate, narrowed toward apex from the middle, the apex three-fifths as wide as the base; sides parallel in basal half; disk very finely, sparsely punctate, with two discal rounded spots as in *postica* but without trace of lateral spots. *Elytra* parallel, strongly and rather sparsely punctured, the scutellar spot small, elongate-oval, widely separated from the humeral spot which is narrow and linear, extending nearly to basal third; second fascia slightly behind the middle, rather short, strongly bilobed; subapical spot lunate. Length 15.0–19.0 mm.; width 4.2–6.0 mm.

Western Texas.

The three specimens before me are quite homogeneous as regards the form and extent of the first two fasciæ, but the subapical band is totally wanting in one, and in another it exhibits such a form as to indicate the probability of its being prolonged forward externally in more fully maculate examples, so as to be united to the external lobe of the median spot. The middle spot is so strongly bilobed that it is possible that it may be longitudinally divided into two spots in less fully marked specimens.

**P. concinna** n. sp.—Testaceous; under surface maculate with black; antennae black throughout; legs as in *punctata*; elytra broadly trifasciate, the black predominating nearly as in *terminata*; integuments highly polished. *Head* minutely, very sparsely punctate; eyes moderate; antennae a little less than two-fifths as long as the body; neck with a small evanescent black spot in the middle of the upper surface. *Prothorax* distinctly elongate, narrowed in front from a little behind apical third, the apex nearly three-fourths as wide as the base; sides parallel; disk minutely, very sparsely and irregularly punctate, feebly impressed in the middle near the base. *Elytra* parallel, three times as long as wide, each with the four usual fine feeble subcostiform lines, the third joining the marginal behind the humeri; disk finely, generally somewhat sparsely punctate, the basal spots always broadly united. Length 11.5–18.0 mm.; width 3.0–5.0 mm.

Western Texas.

This species is closely allied to *terminata* but is well distinguished by its more polished and sparsely punctate elytra, and by its antennal structure; it is still more definitely separable from that species by the form of the maxillary palpi of the male, the latter being more elongate and with the terminal joint much less externally developed toward base in *terminata* than in *concinna*.

Most of the specimens before me have the head and pronotum maculate as in *terminata*, but two of them have these parts almost

completely deprived of spots except the two discal ones of the pronotum, which are reduced to minute points. The basal spots of the elytra are more elongate here than in *terminata*, and are always broadly coalescent, while in the latter they are frequently separated, the outer one occasionally disappearing.

**NEGALIUS** n. gen.

Body strongly cuneiform and convex, the wings apparently not quite as long as the elytra, the inflexed sides of the latter narrow, exposing the side-pieces of the sterna. Head even, nearly flat anteriorly, the antennæ arising just before and within the eyes and but moderately distant at base, short, filiform, compressed, the joints compactly joined and nearly parallel-sided; eyes moderate, oval, feebly emarginate at the middle anteriorly; mandibles small, stout, almost rectangularly bent in the middle, the apical portion polished and longitudinally trisulcate, the apex broadly subtruncate and serrate, the teeth being four or five in number; maxillary palpi moderate, rather slender, the last joint subparallel and truncate; epistoma transverse, truncate at apex, the suture very fine, not noticeably impressed; labrum short, transverse, subtruncate at apex, the angles rounded. Metasternum moderately long, the middle coxæ not extending to the posterior margin. Legs rather long and slender; tibial spurs all very slender; those of the anterior and intermediate very unequal, the longer nearly twice as long as the shorter, the posterior but slightly unequal in length; tarsi shorter than the tibiæ, the claws slender, feebly arcuate, with a small very slender acute oblique tooth near the base.

This genus belongs near *Phodaga* and has the basal joint of the anterior tarsi similarly modified in the male, but differs in its long tibiæ, unmodified in the male, correspondingly short tarsi, mandibular structure and toothed claws, the latter being rather cleft than toothed in *Phodaga*. The single species is altogether different in general habitus from *Phodaga alticeps*.

**N. marmoratus** n. sp.—Rather short and convex, strongly cuneiform, black throughout; integuments dull, the pubescence cinereous, minute and appressed, sparse on the head and pronotum, but forming small uneven sparsely placed spots on the elytra, these pubescent areas being feebly depressed or eroded. Head subquadrate, feebly, evenly convex, sparsely, extremely minutely punctate, the punctures being entirely filled by the hairs; occiput evenly arcuate viewed posteriorly; antennæ one-third longer than the head, in structure nearly as in *Phodaga alticeps*, but not attenuate toward apex. Prothorax subrectangular, slightly wider than long and a little narrower than the head, broadly tumid posteriorly; sides parallel, broadly rounded at apex; disk finely canaliculate along the middle, finely, very feebly and sparsely punctate. Scutellum triangular, polished. Elytra at base about

three-fourths wider than the prothorax, at apical fourth nearly four times as wide as the latter, about two-thirds longer than wide, each with two discal and one marginal fine feebly elevated lines, the disk very dull, minutely and strongly granulato-reticulate but not punctate. *Legs* rather long and very slender. Length 9.8–11.8 mm.; width 4.6–6.0 mm.

Western Texas.

The sexual modification of the abdominal apex is not at all conspicuous in the two males before me.

## CURCULIONIDÆ.

### CLEONINI.

The subgenus *Apleurus* of Chevrolat is somewhat comprehensive, but as represented by *A. fossus*, apparently intended by the author as the generic type, it may be described in general terms as having the beak flattened, thick and broad, and more or less devoid of medial carination, the tarsi with pads of dense pubescence beneath, the elytral maculation confused or at least non-vittate, and the prothorax angulate and constricted anteriorly at the sides. These characters all pertain to the groups separated by LeConte under the names *Cleonopsis* and *Cleonaspis*.

It seems to be impossible to separate the species allied to the typical *Cleonus* of Europe into groups which can in any way be considered of generic value, and, as far as our own fauna is concerned, there are apparently but three distinct genera which may be defined as follows:—

Prosternum with an erect spiniform process before each coxal cavity; tarsi extremely coarsely and sparsely spinose beneath, without trace of densely pubescent brushes.....**Dinocleus**

Prosternum normal, without spiniform processes; tarsi with brushes or pads of yellowish-brown pubescence beneath.

Beak thick, more or less dilated toward apex; densely pubescent pads sometimes imperfectly developed or obsolete on the posterior tarsi...**Cleonus**

Beak slender, cylindrical and more arcuate, generally not appreciably dilated at apex; body less stout, often very slender.....**Lixus**

### **DINOCLEUS** n. n.

*Centrocleonus* || Lec.

The species of this distinct genus are more robust and oval in outline than in *Cleonus*, and are readily distinguishable by their



broad flattened beak which is occasionally feebly carinate along the middle and always strongly dilated at apex, by the angulate or tuberculate sides of the prothorax, prosternal spines and absence of brushes of yellow spongy pubescence from the lower surface of the tarsal joints, the latter being simply coarsely and sparsely spinose. I have been obliged to change the name originally given by Dr. LeConte, as the name *Centrocleonus* had been assigned by Chevrolat three years before to a South African genus or sub-genus. Our species may be readily identified by the following table:—

Alternate elytral intervals more strongly elevated, especially toward base.

Elytral setæ long and bristling.

Larger species, the alternate intervals very strongly elevated; head coarsely, densely punctate; genæ almost glabrous; vestiture longer paler and extremely dense ..... **pilosus**

Smaller species, the alternate intervals feebly elevated; head more sparsely punctate; genæ densely pubescent; vestiture shorter, sparser and darker in color ..... **jacobinus**

Elytral setæ short and inconspicuous.

Beak finely, distinctly carinate along the middle.

Robust and suboval; elytral vestiture whitish, denuded in large blotches of which a large oblique area near basal third and a broad transverse fascia at apical third are especially noticeable ..... **angularis**

Narrower, more parallel and more depressed; vestiture cinereo-ferruginous, extremely dense, and denuded on the elytra only in a few small spots ..... **denticollis**

Beak not carinate, sometimes feebly, narrowly bisulcate.

Alternate intervals rather strongly elevated; elytral vestiture finer shorter and sparser, not denuded, although much sparser in a broad discal region near basal third and a narrower transverse fascia at apical third ..... **porosus**

Alternate intervals more feebly elevated; elytral vestiture coarser, more squamiform, much denser and more recumbent but in great part denuded in very large blotches especially in the same regions as in *porosus* ..... **farctus**

Alternate intervals not more strongly elevated or only extremely feebly so; form more elongate-oval.

Sutural stria of the elytra not more strongly impressed.

Sutural interval not dissimilar in vestiture.

Elytral vestiture dense, persistent, denuded, in small widely distant areas, in which the punctures of the elytral series become conspicuously larger.

Large species, very robust, the sides of the prothorax feebly divergent and arcuate from the tubercles to the base ..... **saginatus**

Smaller species, much less stout, the sides of the prothorax sub-parallel behind the tubercles.....**albovestitus**  
 Elytral vestiture rather less dense, not denuded in definable spots but slightly denser along the alternate intervals, extremely easily removable; punctures of the elytral series uniform in size throughout.

**molitor**  
 Sutural interval evenly clothed with shorter sparser and darker vestiture, forming an even sutural vitta.....**wickhami**  
 Sutural stria broadly and strongly impressed almost throughout the length but especially so between basal and apical third.....**densus**

In distribution the genus *Dinocleus* seems to be confined to the desert regions of Southern and Lower California, thence extending through the southern parts of Arizona and along the western slope of Mexico at least as far as Acapulco.<sup>1</sup>

**D. pilosus** Lec.—*Centrocleonus pil.*: Proc. Am. Phil. Soc., XV, p. 145.—Robust, oval, black, moderately shining, the nearly flat bottoms of the large punctiform foveæ highly polished. *Head* coarsely, rather densely punctate, nearly denuded of pubescence; beak broadly bisulcate, nearly twice as long as wide, densely clothed above but abruptly glabrous on the flanks, a little shorter than the prothorax. *Prothorax* a little wider than long, strongly tuberculate laterally at apical fourth, the sides thence parallel to the base and feebly sinuate immediately behind the tubercle; apex transverse, three-fourths as wide as the base, the latter broadly triangular; disk extremely coarsely, deeply, unevenly punctato-foveate, the interspaces densely, finely but strongly punctate, with a very fine imperfect median pubescent line, a broader sinuate line laterally which is bifurcate toward base, the lateral tubercle also more densely pubescent. *Scutellum* small but distinct. *Elytra* two-fifths longer than wide, a little more than twice as long as the prothorax, and, in the middle, nearly two-fifths wider than the latter; sides arcuate, the humeri not distinctly exposed; apex broadly conjointly rounded; disk with rows of large deep punctures, the alternate intervals very strongly costiform; pubescence very dense, denuded in a small spot between the third and seventh interval at basal third which does not at all interrupt the elevated fifth interval, also in a small discal spot just behind the middle of each elytron. *Abdomen* densely squamulo-pubescent, densely speckled with small subdenuded points. *Legs* robust, densely pubescent, the femora annulate with denser, paler vestiture at apical third. Length 11.7 mm.; width 5.3 mm.

California. Cab. LeConte.

Described from the unique type which is in an excellent state of preservation. The species may be known at once by the strongly costiform alternate elytral intervals and long erect bristling setæ, in addition to the dense vestiture.

<sup>1</sup> The measurements of length, which follow, are exclusive of the beak, *i. e.*, from the anterior margin of the eye to the apex of the elytra.

**D. jacobinus** n. sp.—Moderately robust and convex, suboval, black, dull in lustre, densely clothed with short dark plumbeous squamiform hairs and with sparse erect setæ. *Head* sparsely punctate, subdenuded; beak densely pubescent, feebly bisulcate, one-half to two-thirds longer than wide, much shorter than the prothorax, denuded at the sides toward base, the genæ densely pubescent. *Prothorax* distinctly wider than long, very strongly angulato-tuberculate at the sides anteriorly, the width at this point slightly greater than at base, the sides sinuate behind the tubercle; apex truncate, three-fourths as wide as the base, the latter broadly angulate and bisinuate; disk extremely coarsely unevenly and densely foveate, the interspaces dull finely, densely punctate, densely pubescent laterally. *Elytra* one-half longer than wide, distinctly more than twice as long as the prothorax and from one-fourth to one-third wider than the latter; sides nearly parallel and straight in basal two-thirds, then rounded to the apex; humeri almost rectangular and quite broadly exposed; disk with the alternate intervals slightly costiform, a deeply eroded and denuded oblique spot from the fourth interval toward the humeri which interrupts the costiform elevations, also a small discal spot on each elytron nearer the suture and behind the middle. *Abdomen* densely pubescent, speckled with black points. *Legs* short, moderately stout, densely, coarsely pubescent, the vestiture slightly denser on the femora at apical third above but not beneath. Length 6.5–9.0 mm.; width 2.7–4.0 mm.

California (San Diego).

This species, represented before me by a good series of eight specimens, is allied to *pilosus* but differs in its much smaller size, coarser shorter darker and more sparsely placed vestiture, in its more parallel elytra with exposed humeri, in its less costiform elytral intervals and many other characters.

**D. angularis** Lec.—(Cleonus) Col. Kansas, etc., p. 18; *Centrocleonus ang.*: Proc. Am. Phil. Soc., XV, p. 146.—Rather robust and convex, suboval, black, somewhat dull in lustre, the vestiture squamiform, recumbent, very dense except in the denuded spots. *Head* coarsely, sparsely punctate, the interspaces finely, densely so; beak a little shorter than the prothorax, two-thirds longer than wide, densely clothed above, rather finely but very strongly carinate, the carina feebly arcuate when viewed laterally. *Prothorax* about one-fourth wider than long, the lateral tubercle very prominent, the disk thence parallel-sided and distinctly narrower to the base, the latter broadly triangular, wider than the truncate apex; disk very coarsely, unevenly foveate, obliquely pubescent laterally and sometimes narrowly along the middle. *Elytra* about two-thirds longer than wide; sides distinctly arcuate, obliquely rounded to the apex, the latter somewhat parabolically rounded; humeri not noticeably exposed or prominent; disk with rather impressed series of very coarse deep punctures, the alternate intervals but feebly costiform, the vestiture denuded in large irregular blotches of which an oblique fascia near basal third and a broad transverse band at apical third are chiefly prominent, the sutural interval pubescent throughout. *Abdomen* densely squamulo-pubescent;

segments three to five more sparsely so toward base, the fine semi-denuded points not very evident. *Legs* short and robust, densely clothed, the femora feebly annulate with paler and denser pubescence at apical third. Length 9.8–10.5 mm.; width 4.2–4.8 mm.

New Mexico.

The two typical representatives of this species which I have before me are both from New Mexico, and I also refer to it a specimen from Arizona which is more elongated and parallel with a rather less developed rostral carina and more broadly pubescent median area of the pronotum.

**D. denticollis** n. sp.—Moderately robust, somewhat depressed above, elongate-suboval, black and somewhat dull throughout, extremely densely clothed with short recumbent squamiform pubescence, cinereous to ferruginous in color, the erect hairs very short, sparse. *Head* sparsely punctate; beak about one-half longer than wide, a little shorter than the prothorax, flattened, broadly bisulcate, very densely pubescent above, the medial carina rather narrow but not acute, moderately elevated. *Prothorax* fully one-fourth wider than long, widest at the anterior lateral tubercles which are very pronounced; sides behind them parallel to the base, the latter broadly cusped in the middle, much wider than the apex; disk very coarsely, unevenly foveolate, broadly, obliquely pubescent laterally and more or less broadly but rather less densely so in the middle. Scutellum very small. *Elytra* two-thirds longer than wide, much more than twice as long as the prothorax and about one-third wider; sides feebly arcuate especially behind, obliquely convergent to the apex, the latter narrowly subtruncate; humeri not much exposed or prominent; disk with series of moderate sized, rather distinct punctures, the alternate intervals rather strongly elevated, the extremely dense pubescence imperfectly denuded in an oblique spot on each elytron at basal third and posteriorly in a large elongate spot parallel to the side margin from the middle nearly to the apex, also behind the middle near the suture along the second interval. *Abdomen* extremely densely pubescent, the small denuded points sparse. *Legs* moderately stout, the femora feebly annulate at apical third. Length 9.5–10.0 mm.; width 4.0–4.4 mm.

Arizona (Peach Springs). Mr. H. F. Wickham.

The typical series of five specimens represents a species somewhat allied to *angularis* but differing completely in the general arrangement of the denuded elytral spots, also in its smaller size, narrower and more depressed form and smaller punctures of the elytral series. The general direction of the elytral denudation is longitudinal in this species but is more transverse in *angularis*.

**D. porosus** Lec.—*Centrocleonus por.*: Proc. Am. Phil. Soc., XV, p. 146.—Robust and convex, suboval, black, the integuments strongly shining and



polished; pubescence very short, dense, pale cinereous in color. *Head* coarsely, somewhat closely punctured, the beak much shorter than the prothorax, about two-thirds longer than wide, densely pubescent and narrowly, feebly bisulcate above, abruptly nearly glabrous at the sides. *Prothorax* one-fourth wider than long, widest at the anterior tubercles which are small but very pronounced; sides thence to the base parallel and straight; base broadly angulate, the scutellar lobe slightly produced and rounded; apex subtruncate, but slightly more than two-thirds as wide as the base; disk very coarsely, deeply foveate, the bottoms of the foveæ highly polished, the interspaces densely and rather strongly punctate; pubescence dense laterally, the inner margin of the pubescent area sinuous. Scutellum very small. *Elytra* scarcely two-thirds longer than wide, two and one-half times longer, and, in the middle, two-fifths wider than the prothorax; sides arcuate, obliquely convergent behind to the apex which is rather acutely ogival; humeri not prominent; disk with series of extremely large deep and somewhat distant punctures, the alternate intervals distinctly elevated and costiform, the vestiture imperfectly denuded in a large transverse discal area before the middle and a narrower transverse band three-fifths from the base, the sutural interval evenly pubescent throughout. *Abdomen* very densely pubescent but sparsely so on segments three to five except at the sides and along the apices, the small denuded points nearly obsolete. *Legs* moderately stout, densely clothed, the femora annulate at apical third. Length 11.5 mm.; width 5.0 mm.

Lower California (Cape San Lucas). Cab. LeConte.

The unique type is in an almost perfect state of preservation, and the species may be easily identified by its very coarse punctures of the elytral series, feebly bisulcate beak and peculiarities of the vestiture which will be more fully described under the next species.

**D. farctus** n. sp.—Robust and convex, oval, black and rather shining throughout, the vestiture cinereous. *Head* coarsely, sparsely punctate, the punctures deep and variolate; beak three-fourths longer than wide, slightly shorter than the prothorax, densely pubescent above, glabrous at the sides, the pubescent region much narrower than the beak and scarcely perceptibly bisulcate, the lateral edges broadly convex. *Prothorax* more than one-fourth wider than long, subconical in form, slightly wider at base than at the anterior tubercles, the latter small and but moderately prominent, the sides behind them slightly divergent to the base and nearly straight; base broadly angulate, the slightly produced scutellar lobe angulate, the apex broadly arcuate, scarcely two-thirds as wide as the base; disk coarsely, extremely unevenly foveate, a median discal area before the middle more or less impunctate and finely canaliculate; vestiture obliquely dense laterally. *Elytra* nearly three-fourths longer than wide, two and one-half times as long as the prothorax; sides broadly arcuate; humeri not prominent; disk broadly rounded in apical third, having series of very large deep somewhat distant punctures, the alternate intervals but feebly elevated, the vestiture in great part denuded

in large blotches, especially in a large discal area before the middle and a broad transverse band behind the middle, the suture narrowly pubescent throughout. *Abdomen* extremely densely pubescent, the last three segments sparsely so along the basal margins, the denuded points obsolete. *Legs* moderately robust, densely clothed, the femora not distinctly annulate. Length 13.7 mm.; width 6.0 mm.

California (near the southern boundary). Mr. Dunn.

A large and distinct species, represented by a single specimen. It is allied to *porosus* but is much larger and with larger denuded areas on the elytra, a more conical prothorax, more narrowly pubescent and less sulcate beak, and differs also in several other important respects. The vestiture, where not denuded, is denser than in *porosus*, and consists of rather broad attenuate scales, recumbent and mutually overlapping, while in *porosus* it is composed of very short robust or subsquamiform hairs which are erect, and, although dense, everywhere mutually separated. The posterior femora in *farctus* are longer than in *porosus*, extending nearly to the middle of the fifth ventral segment, while in the latter they extend scarcely beyond the base of the fourth.

**D. sagnatus** n. sp.—Very robust, convex, the integuments black and rather strongly shining throughout; the vestiture short, broadly squamiform, very dense and persistent throughout; pale ochreous-cinereous in color. *Head* and beak densely clothed throughout and with large widely scattered punctures, which are not concealed by the vestiture; beak not as long as the prothorax, broadly flattened and without distinct sulcations or carina. *Prothorax* scarcely one-fifth wider than long, the sides feebly convergent from base to apex, strongly tuberculate at apical fourth, the sides thence to the base feebly arcuate; apex truncate, two-thirds as wide as the base, the latter broadly angulate throughout and without distinct scutellar lobe; disk very slightly wider at base than at the subapical tubercles; very broadly, feebly impressed before the scutellum, sparsely, very coarsely foveate, the bottoms of the foveæ polished, the interspaces rather strongly, densely punctate; along the middle there is a very narrow opaque but non-pubescent line, the vestiture dense laterally as usual. *Elytra* one-half longer than wide, two and three-fourths times longer, and, behind the middle, nearly four-fifths wider than the prothorax; sides nearly straight, obliquely, strongly convergent in apical third, the apex narrowly, arcuately subtruncate; humeri obliquely truncate; disk slightly widest behind the middle, with unimpressed rows of very deep, distinct, moderately large punctures, which, in the small oblique subdenuded spot at basal third, and another nearer the suture behind the middle, become very large and conspicuous; there is also a small denuded spot near the side at basal fourth. *Abdomen* and legs extremely densely clothed throughout, the small denuded points of the former very sparse. Length 15.5 mm.; width 6.6 mm.

## Arizona.

A fine large species, allied to *albovestitus*, but differing in its very much more robust form, and in the more conspicuously enlarged punctures of the elytral striæ at the points mentioned in the description. It is represented by a single specimen which is probably a female.

**D. albovestitus** n. sp.—Elongate-ovoidal, somewhat convex, black, rather dull in lustre, the vestiture white, extremely dense, squamiform. *Head* and beak densely clothed above, the latter subglabrous at the sides and narrowly, feebly subcarinate along the middle, three-fourths longer than wide and much shorter than the prothorax. *Prothorax* but slightly wider than long; sides parallel and nearly straight, angulate anteriorly, the disk tubularly produced at apex for one-sixth the length, the apex subtruncate, three-fourths as wide as the base, the latter broadly angulate and feebly bisinuate; disk very coarsely but sparsely and unevenly foveo-variolate, the interspaces finely, densely punctate, generally with a very fine feeble medial carina throughout the length; pubescence dense laterally, the oblique margins of the dense areas emarginate in the middle. *Elytra* twice as long as wide, not quite three times as long as the prothorax and two-fifths wider than the latter; sides parallel and nearly straight, obliquely convergent in apical third, the apex narrowly subtruncate; humeri slightly exposed and obliquely truncate; disk with series of rather large, moderately distant punctures, the dense vestiture denuded only in rather small uneven spots especially near basal and apical third and near the middle line of each elytron. Under surface and legs extremely densely clothed with pure white squamiform pubescence, the legs rather slender, the femora not annulate. Length 9.4–11.8 mm.; width 3.8–4.8 mm.

California (Los Angeles and Colton).

This species is not very closely allied to any other, and may be easily known by its general similarity in form to *molitor*, by its exceedingly dense, and, in perfect specimens, brilliant white vestiture which is not so easily removable as in the *molitor*, but which—as in that species and especially in less fully pubescent specimens, is frequently denser along the alternate intervals of the elytra. It is represented in my cabinet by a series of six specimens.

**D. molitor** Lec.—Proc. Phil. Acad., 1853, p. 78 (Cleonus); *Centrocleonus mol.*: Proc. Am. Phil. Soc., XV, p. 146.—Oblong-oval, rather convex, black, feebly shining, somewhat densely clothed with recumbent squamiform pubescence which is easily removable, rather uniformly distributed but a little denser along the alternate intervals of the elytra. *Head* and beak coarsely, sparsely foveate. *Prothorax* generally slightly conoidal and very nearly as long as wide, angulate and constricted near the apex. *Elytra* quite distinctly less than twice as long as wide, fully three times as long as the prothorax

and from one-half to three-fourths wider than the latter, the humeri obliquely truncate; disk with even rows of deep and moderately distant punctures which are quite moderate in size. Length 14.0–16.5 mm.; width 5.5–7.0 mm.

Southern California and Arizona.

The series of ten specimens which I have before me indicates but slight variation in this rather abundant and well-known species. I obtained a number of specimens at Yuma in December, mostly *in copula* and entirely exposed to the intense heat of the sun on the surface of loose dry sand; the fact that complete desiccation does not take place very soon under these conditions is only to be accounted for by the unusual density and thickness of the integuments, the latter being characteristic of most of the desert-loving Curculionidæ and Tenebrionidæ, and undoubtedly developed from their peculiar environment.

Two specimens from Guerrero, Mexico, collected by Mr. Baron, do not differ from the typical forms to any perceptible extent.

**D. wickhami** n. sp.—Elongate, subparallel, rather convex, black, somewhat dull, densely clothed with white and brown squamiform pubescence. *Head* sparsely punctate; beak nearly twice as long as wide, shorter than the prothorax, obscurely bivittate, more sparsely clothed along the middle and on the flanks. *Prothorax* about as long as wide, constricted and briefly tubulate at apex; sides parallel and nearly straight; antero-lateral angulations small and tuberculiform; base broadly angulate, feebly lobed in the middle; disk moderately coarsely and rather sparsely punctate, almost impunctate near the middle, impressed in the middle near the base; pubescence dense in a sublateral sinuous vitta, also in a narrower medial line. *Elytra* twice as long as wide, nearly three times as long as the prothorax and fully two-fifths wider than the latter; sides parallel and nearly straight, obliquely convergent in apical third, the apex narrowly subtruncate and emarginate; humeri obliquely truncate; disk with unimpressed rows of comparatively small and not very close-set punctures, the white vestiture dense on the flanks and in a broad discal vitta, the brown prevailing in a broad intermediate vitta and also throughout the sutural interval, a few small subdenuded spots are irregularly distributed from outer third to the sutural interval, one at lateral third just before the middle and a few still smaller, nearer the suture and just behind the middle especially evident. *Abdomen* very densely clothed with white vestiture, feebly speckled with minute subdenuded points, the last three segments more sparsely pubescent toward base, a small rounded depressed area at the middle of the apex of the first segment also subdenuded. *Legs* rather long and but moderately stout, the femora not annulate. Length 11.5 mm.; width 4.8 mm.

California (Colorado Desert at Indio—about 100 feet below the sea-level). Mr. H. F. Wickham.



The single specimen which I have been able to study represents a very distinct and interesting species, especially distinguishable by the coarsely and irregularly tessellated vestiture of pure white and dark brown.

**D. densus** n. sp.—Oblong, suboval, somewhat depressed, black, rather dull in lustre, extremely densely clothed throughout with cinereo-ferruginous squamiform vestiture which is rather persistent. *Head* and beak rather finely, sparsely punctate, the beak much shorter than the prothorax, densely clothed throughout but a little less densely so along the middle and on the flanks, broadly, feebly convex above but not distinctly carinate. *Prothorax* nearly as long as wide, very strongly constricted and briefly tubulate at apex; sides parallel and nearly straight, antero-lateral angles obtuse and feebly tuberculiform; disk sparsely and coarsely but somewhat feebly punctate, the interspaces finely and densely punctato-rugulose; pubescence moderately dense but abruptly very dense laterally, the dividing line being but slightly oblique and broadly sinuous. *Elytra* a little less than twice as long as wide, about two and one-half times as long as the prothorax, and, in the middle, from one-third to one-half wider than the latter; sides broadly, feebly arcuate, obliquely convergent in apical third, the apex feebly produced and subtruncate; humeri narrowly oblique; disk extremely densely clothed, the vestiture not denuded but just visibly less dense along the alternate intervals, the sutural stria broadly, deeply impressed, the stria punctures almost completely obscured by the vestiture. *Abdomen* and legs extremely densely clothed throughout with ochreous-white, the legs rather short and but slightly robust. Length 10.0–15.0 mm.; width 3.9–6.0 mm.

Arizona (Winslow). Mr. Wickham.

Apparently taken in abundance; my series is very homogeneous and consists of one small male and four much larger females, the latter with distinctly broader and longer rostrum. This species can easily be identified by its rather depressed form, dense and persistent vestiture, unusually sparse and feeble punctuation, and by the broadly impressed sutural stria of the elytra.

### CLEONUS Schön.

This very composite genus includes a large complex of species of varied but generally more or less robust form, and especially with the rostrum thick and broad. It has been subdivided by several authors, notably Chevrolat and Motschulsky, into a number of groups, nearly all of which are indefinitely limited and therefore incapable of taking rank as valid genera. The subgeneric groups within our boundaries may be defined in general terms as follows:—

ANNALS N. Y. ACAD. SCI., VI, Nov. 1891.—13.

Beak broad and more or less flat; pattern of the elytral maculation obliquely subfasciate; prothorax always constricted near the apex.

Beak strongly tricarinate, the lateral carinæ frequently obsolete.

**Stephanocleonus**

Beak not strongly carinate, generally completely non-carinate ... **Apleurus**

Beak nearly cylindrical, often obsoletely carinate; form of body intermediate between *Apleurus* and *Lixus*, the pattern of elytral ornamentation always more or less vittate; prothorax generally not constricted at apex.

**Cleonidius**

The species may be outlined as follows:—

Subgen. **Stephanocleonus** Mots.

Humeri obliquely truncate; vestiture extremely short and pruinose.

**plumbeus** Lec.

Humeri rounded; vestiture longer, much denser and paler... **cristatus** Lec.

Subgen. **Apleurus** Chev. (type *fossus*).

*Cleonopsis* Lec.; *Cleonaspis* Lec.

Robust, the beak obsoletely carinate, the vestiture dense, cinereous, the elytra each with two large oblique subdenuded spots and a subapical slightly denuded area; pubescent pads of all the tarsi quite distinct, but much less so on the posterior ..... **pulvereus** Lec.

Slightly less robust, the beak completely non-carinate, smaller in size; vestiture very dense, ferruginous, the maculation extremely obscure but nearly as in *pulvereus*; legs and tarsi rather more slender, the pubescent pads rather small, and, on the posterior, almost obsolete in the male but visible on the third joint in the female..... **lutulentus** Lec.

NOTE.—It will be observed that similar differences in the extent of the tarsal brushes are observable in the next subgenus, and have been alluded to by LeConte (Proc. Am. Phil. Soc., XV, p. 148).

Subgen. **Cleonidius** n. subg.

*Cleonus* Lec.; *Apleurus* Chev. (pars—"espèces lyxiformes").

Sec. I.—Second joint of antennal funicle much shorter than the first; body thicker and more oval; beak long, very thick, distinctly dilated at apex.

Prothorax constricted at the sides near the apex.

Constriction strong; vestiture extremely dense and rather long, completely concealing the punctuation, denuded on the elytra in small rounded sparsely placed spots, which are only distinct near the suture and lateral margin; prothorax deeply excavated in the middle toward base.

**collaris** Lec.

Constriction feebler and nearer the apex; vestiture very short and sparser, not concealing the punctuation; elytra with a broad imperfectly denuded sublateral and narrower subsutural vitta, and often sparsely marmorate with small spots of denser pubescence ..... **grandirostris** n. sp.

Prothorax not conspicuously constricted at the sides.

Elytra very densely squamulo-pubescent, the vestiture often slightly thinner along a subsutural and broader submarginal vitta.

Prothorax "longer than wide, distinctly carinate" .... **inornatus** Lec.

Prothorax distinctly wider than long, not definitely carinate.

**canescens** Lec.

Elytra sparsely pubescent, vittate with denser vestiture.

Elytra marmorate with uneven patches of dense cinereous pubescence which are more densely aggregated along the margin and in a broad region between the first and fifth series of punctures.

**carinicollis** Lec.

Elytra with continuous marginal pale vitta and another between the second and fifth elytral series, the latter often divided into two vittæ, the sparsely pubescent subsutural and submarginal vittæ more or less speckled with spots of dense pubescence ..... **trivittatus** Say

*præpotens* Say

Elytra almost glabrous, sparsely pubescent toward base and on the third and fifth intervals behind the middle, also with a submarginal vitta; each elytron subcarinate in the middle toward base..... **bicarinatus** n. sp.

Elytra almost glabrous, with a narrow even vitta occupying the third interval, and another, but slightly broader, along the lateral margin, both composed of dense pure white pubescence ..... **lecontei** n. sp.

NOTE.—The Mexican *boucardi* Chev. also belongs here and probably in the neighborhood of *lecontei*.

Sec. II.—*Second joint of funicle much shorter than the first; body more slender, subparallel; beak generally rather long, much thinner and not distinctly dilated at apex.*

Elytra densely pubescent, with a narrow subsutural and broader submarginal vitta partially or completely denuded.

Vittæ extremely feebly defined, with the pubescence but slightly sparser; beak finely, very densely punctate and pubescent; vestiture throughout cinereous and extremely dense. Massachusetts... **calandroides** Rand.

Vittæ well defined but strongly marmorate with denser patches.

Pronotum strongly carinate, extremely coarsely, sparsely punctate.

**sparsus** Lec.

Pronotum not at all carinate, usually more strongly constricted near the apex, especially in the female ..... **frontalis** Lec.

*puberulus* Lec.

Vittæ well defined and not or scarcely at all mottled, generally even.

Prothorax without ocular lobes, the vibrissæ very long; pronotum distinctly carinate ..... **quadrilineatus** Chev.

Prothorax with strong and distinct ocular lobes, the vibrissæ short.

Pronotum not at all carinate, the punctures sparse; elytral vestiture moderately long, dense..... **lobigerinus** n. sp.

Pronotum feebly carinate, the punctures not quite so coarse, dense and subconfluent; beak short, robust, finely but strongly, densely punctate, with a narrow slightly tumid median impunctate line; elytral

vestiture short and very sparse throughout; form rather short, the elytra barely twice as long as wide.....**kirbyi** n. n.

*vittatus* Lec. nec Kirby

Elytra densely pubescent, each elytron with several narrow denuded vittæ; beak finely, strongly punctulate and also with coarse somewhat sparse punctures, moderately carinate; pronotum with very coarse more or less remote punctures, feebly carinate; elytra much more than twice as long as wide.....**vittatus** Kirby

*poricollis* Mann.

var. *virgatus* Lec.

Elytra more or less densely squamulo-pubescent and often sparsely speckled with denser spots, the vestiture always denser along the lateral margins and forming a conspicuous marginal vitta; pronotum not carinate.

Beak gradually and feebly attenuate from base to apex...**modestus** Mann.

*californicus* Mots.

*pleuralis* Lec.

Beak parallel or very feebly dilated at apex.

Vestiture long, dense, pubiform and villose.....**circumductus** n. sp.

Vestiture short, much less dense, more recumbent and squamiform; body cylindrical, strongly convex.

Beak compressed above and strongly, narrowly tumid along the middle.

**texanus** Lec.

Beak cylindrical, not at all compressed; prothorax larger, much more finely punctured.....**subcylindricus** n. sp.

Sec. III.—*Second joint of funicle subequal to the first; body subcylindrical, the beak extremely short and thick but not noticeably dilated at apex.*

Pronotum densely and coarsely granulose.....**graniferus** n. sp.

In the subgenus *Stephanocleonus* there are indications of several other species within our territories, but the material is so limited that they cannot be advantageously defined at present, especially in the absence of the unique type of *cristatus*. It is a question whether our species should be placed in *Stephanocleonus* or *Plagiographus*, but this is a matter of but slight importance as the difference between these subgenera appears to be very inconsiderable.

The above table is somewhat unsatisfactory, owing to my inability to study the original types of some of the more inadequately described species, such as *californicus* and *modestus*. There seems to be but little doubt, however, that *præpotens* is the same as *trivittatus*, as the size of the body and ornamentation of the elytra vary remarkably in the ample series before me.

A number of specimens collected in Arizona and Southern California are referred to *sparsus*, although the prothorax is almost



completely unconstricted near the apex; this character appears however to be quite variable in some species, and especially *frontalis*, in two specimens of which, taken by Mr. Wickham at Greeley, Colorado, one has the prothorax entirely unconstricted and the other—a larger female—very distinctly so.

There are several points in the original description of *vittatus* Kirby, which render it quite certain that the *vittatus* of LeConte is not in reality that species, but an entirely different one. The description alluded to states that the body is narrow, clothed with decumbent hoary pile, that the prothorax is punctured with rather large scattered punctures, and that the elytra have three stripes. None of these characters will apply to the *vittatus* of LeConte, which is rather oval of body, sparsely clothed with very short robust hairs, and having the punctures of the pronotum subconfluent; they all apply strictly however to a series of specimens before me, taken at Puget Sound and in various parts of California, and also to the published characters of *poricollis* Mann. They also suit the description of *virgatus* in all but a few minor particulars, such as the apparently longer prothorax with straighter sides of that species.

Some of the names suggested by LeConte will probably have to be changed, because of previous employment, when the genus *Cleonus* is monographically revised, unless the assignment of the various species to different subgenera be considered sufficiently distinctive. The new forms indicated in the table may be described as follows:—

**C. grandirostris.**—Suboval, moderately robust, convex, densely clothed throughout with very short, recumbent squamiform and cinereous pubescence, the punctures not at all concealed. *Head* rather finely, the beak more coarsely, punctate, the punctures rather sparse; beak subequal in length to the prothorax, distinctly carinate, the carina terminating abruptly behind in a large fovea between the eyes. *Prothorax* rather short, one-third wider than long, the apex broadly arcuate, much narrower than the base, the latter rather acutely cusped in the middle, but slightly oblique thence to the basal angles; sides almost parallel toward base, convergent and slightly sinuate anteriorly; disk with a deep, slightly elongate excavation toward base, not carinate anteriorly, very coarsely, sparsely punctate with the pubescence partially denuded in a broad dark oblique submarginal vitta. *Elytra* twice as long as wide, about one-fourth wider than the prothorax; sides parallel and nearly straight, oblique and nearly straight in apical third or fourth, the apex rather narrowly subtruncate; humeri obliquely rounded to the base of the prothorax; disk with unimpressed series of coarse, very deep, rather distant punctures.

*Abdomen* densely clothed with longer cinereous pubescence and sparsely speckled with rather coarse subdenuded punctures. *Legs* short and but moderately robust. Length 7.5–9.5 mm.; width 3.2–3.6 mm.

New Mexico (Las Vegas and Coolidge); Wyoming (Cheyenne).

A rather isolated species, somewhat resembling *collaris* or *canescens* at the first glance, but distinguished from both by its much shorter less dense vestiture and very coarse punctuation, and from *collaris* in addition, by its much less constricted prothorax and narrower less depressed form. In proportion to the size of the body the beak is larger than in any other of our species.

**C. bicarinatus.**—Short, robust and convex, black throughout, the head and pronotum dull and more pubescent, the elytra polished and in great part glabrous, the vestiture cinereous, short and subsquamiform, forming two narrower and indefinite discal vittæ and a denser marginal line on the pronotum, the elytra pubescent near the base, also feebly on the third interval near the apex, the fifth behind the middle, the ninth throughout, and on the eleventh or marginal interval partially and sparsely. *Head* very finely, densely punctulate, the beak sparsely so and with large, rather densely rugulose punctures; beak robust, dilated at apex, scarcely shorter than the prothorax, broadly carinate toward base and separated from the head by a transverse impression between the eyes. *Prothorax* slightly wider than long, the sides very feebly convergent and nearly straight to apical third or fourth, then more convergent and feebly sinuate to the apex, which is slightly arcuate and scarcely three-fifths as wide as the base, the latter broadly cusped; disk broadly, feebly impressed before the scutellum, feebly subcarinate thence to the apex, finely, strongly, very densely punctulate throughout and with large deep scattered punctures. *Elytra* four-fifths longer than wide, three times as long as the prothorax, and, behind the middle, fully two-fifths wider than the latter, broadly parabolic and distinctly notched at apex, the humeri exposed and slightly tumid; disk with unimpressed rows of rather coarse distant punctures, the series obviously impressed near the suture; each elytron with a short, strongly tumid carina in the middle toward base. Under surface rather densely clothed with long coarse hair, densely speckled on the abdomen with large subdenuded punctures. *Legs* rather short and slender, rugulose, very sparsely pubescent. Length 10.0 mm.; width 4.2 mm.

Texas (near Austin).

A distinct species, not closely related to any other known to me, and notable chiefly for the dense punctuation of the anterior portions of the body, and the short convex polished and almost glabrous elytra which are bicarinate toward base.

**C. lecontei.**—Elongate, suboval, strongly convex, deep black, the integuments extremely sparsely pubescent and polished, except in the narrow

vittæ where the vestiture is white and dense. *Head* finely, the beak more coarsely and both confusedly punctate and subrugulose; beak rather long, subequal in length to the prothorax, distinctly tumid or broadly subcarinate along the middle, the tumid line more sparsely punctate and terminating behind at a feeble transverse impression between the eyes. *Prothorax* about as long as wide, the apex broadly arcuate, much narrower than the base, the latter broadly, strongly cusped in the middle and but feebly oblique thence to the basal angles; sides feebly convergent and almost straight from the base nearly to the apex, then rather more strongly convergent and just visibly sinuate; disk coarsely, not very densely punctate, a rather broad median line almost completely impunctate, the interspaces finely, rather sparsely punctulate, the surface feebly convex except at the basal cusp where it is moderately impressed, also tumid or subcarinate along the middle in apical half, the vestiture forming a dense marginal and a narrower sparser discal vitta on each side. *Elytra* rather distinctly more than twice as long as wide and nearly one-third wider than the prothorax; sides parallel and nearly straight, becoming strongly oblique and nearly straight in apical third, the apex narrowly subtruncate, broadly rounded, and minutely emarginate in the middle; humeri obliquely rounded to the thoracic base; disk with series of rather coarse approximate punctures which become much finer toward apex where also the series become distinctly impressed. *Abdomen* densely clothed with rather long cinereous pubescence. *Legs* rather short and moderately robust, finely, deeply but rather sparsely punctate and somewhat sparsely pubescent. Length 13.0 mm.; width 4.5 mm.

#### Arizona.

This remarkably distinct and beautiful species is represented by a single specimen, formerly a part of the Levette cabinet, and which is without more definite indication of locality than that given above. It is somewhat allied to the Mexican *boucardi* Chev., but the latter has a white vitta between the seventh and eighth striae, while in *lecontei* this interval is entirely nude, the marginal vitta being abruptly limited by the eighth stria and the lateral margin.

**C. lobigerinus.**—Rather slender and convex, the integuments feebly shining; pubescence dense, cinereous, forming a broad discoidal anteriorly constricted spot—which is narrowly denuded along the middle, and a marginal vitta on the pronotum, also denuded on the second, sixth and eighth elytral intervals and less completely so on the seventh. *Head* rather strongly, transversely impressed between the eyes, the beak rather long, feebly carinate, subequal in length to the prothorax. *Prothorax* nearly as long as wide, the apex broadly, feebly bisinuate, distinctly narrower than the base, the latter strongly, angularly lobed in the middle; sides feebly convergent from base to apex and nearly straight in the male, convergent and feebly sinuate near the apex in the female; ocular lobes long and prominent, extending to the eyes, the vibrissæ very short; disk dull, coarsely, rather densely punctate,

narrowly and deeply impressed in basal third, not carinate anteriorly. *Elytra* from two to two and one-half times longer than wide, scarcely one-fourth wider than the prothorax; sides parallel and nearly straight, oblique behind, the apex narrowly arcuato-truncate and minutely emarginate; humeri narrowly oblique to the base of the prothorax; disk with unimpressed series of rather coarse, deep, moderately approximate punctures. *Abdomen* and legs densely, coarsely pubescent and coarsely speckled with subdenuded punctures. Length 6.4-9.0 mm.; width 2.0-3.0 mm.

Arizona (Peach Springs); Southern California.

The disposition of the vestiture in this species is nearly as in *quadrilineatus*, but the hairs are longer, darker and more plumbeous in color and more shaggy. It differs greatly from the form mentioned in the strong apical lobes of the prothorax with short vibrissæ, in the absence of dorsal carina and denser punctuation of the pronotum, also in its longer beak and smaller and more slender body; in *quadrilineatus* the prothoracic lobes are almost completely obsolete, the vibrissæ being however correspondingly longer. The series before me consists of eight specimens.

**C. circumductus.**—Somewhat slender, moderately convex, suboval, the integuments piceous, feebly shining, the pubescence rather long, moderately dense, shaggy, cinereous, almost evenly distributed and without trace of vittæ except at the sides of the pronotum and elytra, which are rather widely margined with abruptly denser and whiter pubescence. *Head* very feebly, transversely impressed at the base of the beak, the latter short, not carinate, densely, rugulose punctate and much shorter than the prothorax, rather sparsely pubescent. *Prothorax* very slightly wider than long, the apex subtruncate and but little narrower than the base, the latter rather strongly, acutely cusped in the middle; sides feebly convergent from base to apex, feebly and evenly arcuate throughout; disk somewhat coarsely, very densely punctate, the punctures in close mutual contact laterally, slightly separated and with the interspaces rather coarsely, deeply punctulate toward the middle, the pubescence rather sparse and almost completely denuded near the marginal vitta, the basal impression small and feeble; dorsal carina completely obsolete. Scutellum completely invisible. *Elytra* a little more than twice as long as wide and nearly one-third wider than the prothorax; sides straight and parallel, gradually, evenly parabolic in apical third, each elytron with a small apical wisp of denser pubescence; humeri rather abruptly rounded to the base of the prothorax and distinctly exposed; disk with unimpressed series of rather small but deep, somewhat distant punctures, the intervals finely but deeply and very densely punctulate. *Abdomen* black, very densely clothed with long cinereous and somewhat unevenly nucleated pubescence. *Legs* not very robust, extremely short, densely pubescent, the hind femora extending only to the apex of the second segment. Length 7.4 mm.; width 2.5 mm.



## Arizona.

The single specimen represents a distinct species, to be readily known by the peculiar disposition of the vestiture, as well as by the unusual length of the latter, also by the small size, dense punctuation and exposed humeri. The elytral vestiture from the marginal vitta to the suture is almost even in distribution, but sparsely speckled with extremely small and feeble denser aggregations of hairs. The ocular lobes of the prothorax are very feebly developed, and the vibrissæ extremely short, coming far from attaining the eyes.

**C. subcylindricus.**—Nearly evenly cylindrical and convex, black throughout, the anterior portions rather dull, the elytra shining; vestiture very short, almost evenly distributed but rather sparse on the elytra except near the lateral margin, where it becomes broadly dense both on the elytra and prothorax. *Head* and beak not coarsely and moderately densely, deeply punctate, the interspaces finely, deeply and very densely punctulate; beak short, robust, scarcely more than two-thirds as long as the prothorax, almost completely glabrous, not carinate. *Prothorax* about as long as wide, the sides feebly arcuate, more convergent anteriorly, the apex about three-fourths as wide as the base, broadly bisinuate; base obtusely cusped in the middle; ocular lobes short and wide, the vibrissæ extremely short, widely distant from the eyes; disk somewhat coarsely, sparsely and unevenly punctate, the interspaces finely but deeply and extremely densely punctulate and dull; surface almost completely glabrous except near the sides, not carinate, the basal impression broad, extremely feeble and scarcely traceable. Scutellum not distinct. *Elytra* quite distinctly more than twice as long as wide and but just visibly wider than the prothorax; sides parallel and almost straight, rather broadly, obliquely arcuate behind, the apex rather narrowly parabolic and minutely emarginate; humeri obliquely, feebly rounded; disk with unimpressed series of not very coarse, moderately distant punctures, the intervals very finely but densely punctulate. *Abdomen* rather sparsely and unevenly clothed, finely punctulate, also with slightly larger widely scattered punctures. *Legs* rather short, somewhat sparsely punctured and pubescent, the hind femora very much longer than the tibiæ. Length 10.5 mm.; width 3.8 mm.

## Florida.

This species is closely allied to *texanus* but differs in its more robust form, larger prothorax, the latter being more finely punctured and much more nearly equal in width to the elytra, in its uncompressed beak, more developed ocular lobes and much shorter vibrissæ, and in its shorter and less pubiform vestiture.

In common with nearly all of the robust Cleonini, each elytral

interval has a single series of small distant punctures, especially visible toward base.

**C. graniferus.**—Cylindrical, convex, black, moderately shining, the vestiture consisting of small recumbent robust hairs, rather sparse on the elytra but denser in narrow feeble vittæ occupying the alternate intervals especially toward apex, also dense in a broader marginal vitta on the pronotum and elytra. *Head* finely punctured, very sparsely along the middle where there is a deep elongate fovea between the eyes; beak robust, parallel, cylindrical, extremely short, scarcely more than one-half as long as the prothorax, sparsely punctured, not at all carinate but broadly tumid along the middle, separated from the head by a deep arcuate transverse groove just before the eyes; surface almost glabrous, narrowly, feebly impressed and rugulose along the sides of the tumid portion, and with a deep elongate median fovea between the antennæ; scape of the latter very short, not more than one-half as long as the remainder, the scrobes strongly convergent beneath but widely separated at apex. *Prothorax* nearly as long as wide, the apex broadly arcuate, four-fifths as wide as the base, the latter broadly, feebly cusped and feebly bisinuate; sides very feebly, evenly arcuate throughout; disk nearly glabrous except along the sides, not at all impressed except feebly along the basal margin, not carinate, densely covered with small irregular shining tubercles or granules. *Scutellum* small but distinct. *Elytra* nearly two and one-half times as long as wide, just visibly wider than the prothorax; sides parallel and nearly straight; broadly parabolic and minutely notched at apex; humeri feebly oblique; disk finely, densely punctulate, coarsely tuberculose and rugulose toward base, with unimpressed series of deep moderately coarse punctures. *Abdomen* densely, finely punctate, rather sparsely clothed with much longer pubescence. *Legs* short, not very stout, rather sparsely punctate and pubescent, the femora strongly emarginate beneath near the apex. Length 12.0 mm.; width 3.8 mm.

#### Georgia.

The prosternum is deeply, broadly emarginate anteriorly, the ocular lobes being moderately developed and fringed with very short vibrissæ, which come far from attaining the eyes. This species differs from any other in our fauna in its peculiar sculpture and very short robust beak, as well as in the structure of the antennæ; it might for these reasons be quite appropriately placed in a separate subgenus.

#### LIXUS Fabr.

Eliminating *modestus* Mann. (*pleuralis* Lec.) and *texanus* from our representatives as tabulated by LeConte (Proc. Am. Phil. Soc., XV, p. 154), and transferring them to *Cleonus*, with which they

agree much more satisfactorily in general organization and particularly in the structure of the antennal funicle, the remaining species constitute a very homogeneous assemblage, distinguishable at once from *Cleonus* by the longer more slender cylindrical and less pubescent beak, in which the modifications due to sex are much more apparent than in the latter genus. In some species, such as *macer* and *sexualis*, this sexual difference in length is extremely conspicuous, the male rostrum being scarcely more than two-thirds as long as that of the female.

The antennæ vary considerably in structure and afford one of the most satisfactory characters for the subordinate grouping of the species, as the relative length of the second funicular joint appears to be affected but slightly by the sex of the individual; in the position of the antennæ, however, the sexes differ quite noticeably, the point of insertion being almost invariably nearer the apex in the male than in the female.

In the following table it has been my endeavor to outline natural groups of species, even when definable only by general characteristics of bodily form or of pronotal sculpture, which may prove more or less difficult to seize upon. It should also be stated that I have been reluctantly compelled to make an unusual number of changes and emendations in the work of Dr. LeConte which, as in the case of *Cleonus*, was apparently founded upon far too slender material.

Elytra prolonged at apex in rather acute and more or less everted processes ;  
species homologous with the European *iridis* Oliv. ....2

Elytra without elongated and everted apical processes .....3

**2**—Body broadly oval, black throughout, the antennæ paler and with the  
first funicular joint very short, not as long as the third and fourth com-  
bined .....1 **caudifer**

Body narrowly oval and more convex, more or less rufescent, the first funi-  
cular joint more elongate and fully equal to the third and fourth.

Ventral segments not angularly produced posteriorly at the sides.

**2 auctus**

Ventral segments two to four abruptly, acutely angulate behind at the sides.

**3 rubellus**

**3**—Second funicular joint short, slightly shorter than the next two combined ;  
scape very long, subequal to the entire remainder; general form robust,  
parallel, the sculpture scabrous, the pronotum broadly impressed.

**4 asper**

Second funicular joint moderately elongate, subequal in length to the next  
two combined.....4

- Second funicular joint slender, distinctly longer than the next two together ; vestiture more or less finely mottled .....11
- 4**—Elytra with a narrow, abruptly limited, densely pubescent and conspicuous marginal or submarginal vitta ; beak completely non-carinate .....5
- Elytra generally not at all vittate, but having the vestiture sometimes condensed laterally and forming a broad feebly defined vitta .....6
- 5**—Pronotum with a small but distinct impression before the scutellum.  
Lateral vitta of the elytra broad and less dense, not concealing the striae punctures .....5 **placidus**  
Lateral vitta narrow and exceedingly dense ; form narrower, the pronotal punctuation coarser, deeper and more rugulose .....6 **amplexus**  
Pronotum completely unimpressed, smaller species.  
Beak finely but strongly, moderately densely punctate, nearly straight.
- 7 oregonus**
- Beak finely feebly and extremely sparsely punctate.  
Beak very feebly arcuate ; prothorax much wider than long ; body rather broadly oval .....8 **eximius**  
Beak strongly arcuate ; prothorax subquadrate ; body slender, convex and linear .....9 **tenellus**
- 6**—Form short, broad and more or less oval, the elytra never more than twice as long as wide ; small species .....7
- Form elongate, generally subparallel, the elytra distinctly more than twice as long as wide .....8
- 7**—Beak finely and feebly but distinctly subcarinate ; elytra with a strong parallel-sided scutellar impression .....10 **marginatus**  
Beak not at all carinate.  
Pronotum more or less broadly impressed throughout the length.
- 11 musculus**
- Pronotum feebly impressed toward base but not before the middle and with coarse, sparsely placed punctures.  
Broadly oval, the vestiture longer, denser and somewhat pubiform.
- 12 parvus**
- Narrowly oval, the vestiture very short, sparse .....13 **pygmaeus**
- 8**—Pronotum broadly flattened and impressed throughout the length or nearly so, the impression always becoming deeper toward base ; rather large species .....9
- Pronotum unimpressed or impressed only near the base ; small or moderately large species .....10
- 9**—Basal joint of the funicle as long as the second ; dorsal impression of the pronotum extending throughout the length but becoming very feeble toward apex.  
Rather slender, the beak very slender, differing notably in the sexes, and, in the female, much longer than the prothorax .....14 **concavus**  
Somewhat robust, the beak stout, finely and feebly but rather distinctly subcarinate, differing but little sexually and subequal in length to the prothorax .....15 **mucidus**



Basal joint of the funicle distinctly shorter than the second; pronotal impression rather deep and distinctly limited, large, wide and extending to apical fourth; beak in the female but very slightly longer than the prothorax .....16 **soror**

**10**—Beak finely but strongly, very densely punctate throughout.

Pubescence throughout very dense and rather long, pale ochreo-cinereous in color and concealing the punctuation of the beak from base to apex, the beak not at all carinate .....17 **laramiensis**

Pubescence very short, rather sparse, not concealing the punctuation of any part; beak with a distinct median carina.

Elytra with apical tufts of long dense pubescence.....18 **mixtus**

Elytra devoid of apical pubescent tufts .....19 **sobrinus**

Beak finely, sparsely punctulate, and, toward base and on the head, with large deep scattered punctures; pronotal punctures very coarse and sparsely distributed; prothorax with a small feeble ante-scutellar impression and more or less strongly constricted at the apex.

Vestiture on the elytra strongly mottled throughout, often broadly sparser along the middle of each elytron but not forming a lateral vittiform line.

Beak very long and slender, fully as long as the prothorax in the male and longer in the female.....20 **sylvius**

Beak shorter and much more robust, distinctly shorter than the prothorax in both sexes .....21 **scrobicollis**

Vestiture of the elytra more or less mottled toward the suture but forming a broad, rather definite lateral condensation, which is joined at apical fifth or sixth by a very short narrow vitta on the third interval; beak very slender, nearly as long as the prothorax in both sexes; body slender .....22 **perforatus**

Vestiture not at all mottled, forming a broad well-defined submarginal vitta, which is joined at apical sixth by a narrow distinct vitta occupying the entire length of the third interval; fifth interval also feebly vittate; beak short and robust in both sexes, much shorter than the prothorax; body more robust .....23 **semivittatus**

**11**—Color black throughout.....12

Color rufo-testaceous, the elytral apices distinctly produced and rounded or subangulate; pronotum longitudinally impressed throughout.....13

**12**—Elytra constricted at the sides just behind the basal angles; beak very long .....24 **macer**

Elytra not constricted at base; beak moderate.

Humeral angles prominent and tumid, the elytral width notably greater than that of the prothorax.....25 **jülichi**

Humeral angles obsolete, the elytra at base not wider than the prothorax.

Prothorax not wider than long, conical, the pronotum narrowly and feebly impressed throughout the length, deeply so at base.

26 **luculentus**

Prothorax wider than long, only impressed near the base.

Beak very sparsely punctate; scattered punctures of the pronotum coarse .....27 **nitidulus**

Beak densely punctured; scattered pronotal punctures fine.

Body narrow, densely pubescent, the vestiture finely, strongly mottled and with a larger subdenuded spot on each elytron near the suture and just behind the middle; beak with a deep inter-antennal fovea, without impunctate median line .....28 **fossus**

Body rather robust, elongate-elliptical, the vestiture scarcely at all maculate, plumbeus, very short and not so conspicuous; beak without trace of inter-antennal fovea, less densely punctured and with a narrow distinctly defined median impunctate line.

29 **obesulus**

**13**—Pronotal punctuation sparse throughout; beak in the female shorter than the prothorax; punctures of the elytral series rather fine and distant.....30 **terminalis**

Pronotal punctuation very dense, rather sparser toward the apex; beak in the female longer than the prothorax; serial punctures of the elytra very coarse and rather close-set; size much smaller; elytral apices more rounded.....31 **sexualis**

1 **L. caudifer** Lec.—Proc. Am. Phil. Soc., XV, p. 156.

Indiana, Illinois and Iowa, also said by LeConte to occur in British Columbia. A fine species of the *iridis* type, much broader in outline than *auctus* and *rubellus*, densely clothed with short plumbeo-cinereous pubescence and with a rather short and slender beak. Length 10.0–13.0 mm.; width 3.2–4.0 mm.

2 **L. auctus** Lec.—Pac. R. R. Rep.; Insects, p. 57; Proc. Am. Phil. Soc., XV, p. 155.

Oregon. The original female type is, as far as I know, the only representative. It approaches the European *iridis* more closely than either of our other species of this group, but still departs widely from it in its much more elongate and longitudinally impressed prothorax. The integuments are dark piceous in color, the beak, legs and antennæ rufo-ferruginous, the vestiture very short and coarse, moderately dense on the elytra. The prothorax is very nearly as long as wide. Length 11.5 mm.; width 3.0 mm.

3 **L. rubellus** Rand.—Bost. Journ. Nat. Hist., II, p. 41; Lec.: Proc. Am. Phil. Soc., XV, p. 155.

Massachusetts to Wisconsin. Much smaller than the others of this small group and easily distinguished by its bright red-brown color and sparse, feebly mottled vestiture.

The abdominal sutures being strongly, posteriorly angulate at the sides in this species and almost perfectly straight throughout

in another so closely allied as *auctus*, affords another instance, if further proof were necessary, of the comparatively slight value possessed by this character, and to indicate the propriety of uniting the Anthonomini and Tychiini, which are at present separated mainly upon this character, but in which the mutual similarity in all other structural features, including habitus, is so pronounced. Length 7.5–9.6; width 2.2–2.8 mm.

4 **L. asper** Lec.—Proc. Am. Phil. Soc., XV, p. 156.

Southern California. This species is somewhat isolated and constitutes a small section, characterized by the rather shorter second funicular joint which is scarcely as long as the next two together, and by the unusually long slender scape. The form is rather robust and subcylindrical, and the pronotum is broadly impressed along the middle, finely, roughly sculptured and sparsely tuberculose toward the sides, especially in the female. Length 11.4–13.5 mm.; width 4.0–4.5 mm.

5 **L. placidus** Lec.—Proc. Am. Phil. Soc., XV, p. 159.

Colorado—LeConte. Easily recognizable in the small section to which it belongs by its comparatively large size, and the other characters given in the table. Length 9.3 mm.; width 3.1 mm.

6 **L. amplexus** n. sp.—Rather slender, convex, cylindrical, black and polished throughout, the antennæ rufescent; pubescence very short, sparse, feebly, sparsely nucleated on the elytra, the lateral vitta of the pronotum and elytra continuous, narrow, extremely dense and pure white. *Head* and beak finely, not very densely punctate, the punctures fine and with others slightly coarser, with a deep rounded fovea between the eyes and another, much elongated, between the antennæ; beak cylindrical, feebly arcuate, rather stout, about three-fourths as long as the prothorax. *Prothorax* very nearly as long as wide, the sides nearly parallel and just visibly arcuate to apical fourth, then more convergent and feebly constricted to the apex, which is truncate and about three-fifths as wide as the base, the latter transverse, feebly but abruptly lobed in the middle; disk with a small but deep and distinct ante-scutellar impression, coarsely, deeply, rather closely and unevenly punctate, the interspaces polished, finely, sparsely punctulate. *Elytra* a little more than twice as long as wide, two and one-half times as long as the prothorax, and, in basal two-thirds, equal in width to the latter, the sides convergent and nearly straight in apical third, the apex acutely ogival and minutely, feebly notched; disk with unimpressed series of rather large distant punctures, the scutellar impression large and distinct. *Abdomen* rather finely, unevenly and closely punctured but strongly shining through the

short fine and rather sparse but evenly distributed vestiture. *Legs* short and robust, strongly punctato-rugulose, very sparsely clothed with short fine hairs. Length 8.2 mm.; width 2.5 mm.

#### Florida.

Rather closely related to *placidus*, but slightly smaller and more slender, and readily distinguishable by the coarser pronotal punctation, the more marked scutellar impression, and, especially, by the nature of the submarginal vitta which is here narrow and extremely dense; in *placidus* the vitta is nearly twice as wide, and formed of pubescence which is much less densely placed, not concealing the punctures of series seven to nine which traverse it.

In *placidus* ten series of punctures can easily be counted on each elytron, while in *amplexus* there appear to be but nine.

**7 L. oregonus** n. sp.—Moderately robust, convex, elongate-oval; body, beak and legs black, the antennæ dark rufo-testaceous; integuments polished throughout, the vestiture very dense and moderately long in the lateral vitta of the pronotum and elytra, elsewhere very short and sparse, forming a broad subsutural and narrow median vitta on each elytron, and rather broadly denuded near the lateral vitta and along a narrow median line on the pronotum. *Head* finely, sparsely punctate, with a small interocular fovea; beak short but rather slender, scarcely more than three-fourths as long as the prothorax, cylindrical, nearly glabrous, very finely, sparsely punctate, the scrobes extending but slightly beyond the middle. *Prothorax* slightly wider than long, the apex truncate, the base broadly, not strongly angulate in the middle; sides rather strongly convergent from base to apex, feebly arcuate, slightly swollen near apical third; disk finely, rather densely punctulate and with rather coarse, somewhat sparse punctures. *Elytra* not more than twice as long as wide, scarcely perceptibly wider than the prothorax, somewhat obtusely rounded at apex; sides parallel and nearly straight; disk feebly flattened near the scutellum and also with a small intrahumeral impression, having completely unimpressed series of somewhat coarse and rather distant punctures, which become much finer toward apex, the intervals excessively minutely, not densely punctulate. *Abdomen* rather densely clothed with longer pubescence which becomes very dense along the sides. *Legs* short, rather robust, sparsely pubescent, the femora with a small spot of dense white pubescence near apical third. Length 7.0 mm.; width 2.4 mm.

#### Oregon.

Represented by a unique specimen of undetermined sex, very kindly given me by Mr. W. Jülich. Although belonging near *placidus*, *oregonus* is immediately distinguishable by the peculiar arrangement of the elytral vestiture, the unimpressed and more transverse prothorax and small size.



8 **L. eximius** n. sp.—Almost evenly elliptical, rather convex, black throughout, the antennæ rufescent with the club dusky; integuments strongly shining; pubescence dense in the lateral vitta of the prothorax and elytra, elsewhere very short, sparse and rather inconspicuous. *Head* convex, very finely, sparsely punctate, with a small deep circular interocular puncture; beak slender, cylindrical, not very arcuate, but little shorter than the prothorax, almost completely impunctate, glabrous, the scrobes extending scarcely to the middle, the antennæ inserted at two-fifths from the base. *Prothorax* fully one-third wider than long, the apex three-fifths as wide as the base, the latter very broadly, feebly angulate; sides convergent from base to apex, feebly arcuate, rather distinctly swollen at apical third; disk evenly, transversely convex, minutely, somewhat closely punctulate and with rather widely scattered moderately coarse punctures. *Elytra* scarcely wider than the prothorax, twice as long as wide, evenly, rather strongly rounded behind, with a minute sutural emargination; sides parallel and nearly straight in basal two-thirds; disk with unimpressed rows of coarse rather distant punctures, the series becoming strongly impressed near the apex; intervals extremely minutely, feebly, sparsely punctulate; scutellar impression very short and feeble. *Abdomen* rather strongly but sparsely punctate, sparsely clothed with longer hair which becomes dense along the sides toward apex. *Legs* short, stout, sparsely pubescent, the femora with a very small tuft of white hair near apical third. Length 5.3 mm.; width 1.8 mm.

Texas (near Austin).

This is one of our smallest species, and is notably distinct because of its almost evenly elliptical form, lateral vitta, smooth impunctate beak and subbasal insertion of the antennæ. It is represented before me by a single specimen, probably a female.

9 **L. tenellus** n. sp.—Slender, subcylindrical and convex, polished, black throughout, the tarsi and antennæ rufous with the club of the latter dusky; vestiture dense in the lateral thoracic and elytral vitta, elsewhere very short and sparse, broadly denuded along the lateral vitta and throughout the median parts of the pronotum, also broadly subdenuded along the middle of each elytron. *Head* convex, very finely, sparsely punctate, with a minute interocular fovea; beak almost as long as the prothorax, strongly arcuate, slender, cylindrical, finely but strongly, extremely sparsely punctate, the antennæ slender, inserted just behind the middle, the scrobes just attaining the middle. *Prothorax* almost as long as wide, cylindrical, the base very feebly, broadly lobed, sides parallel and nearly straight, convergent near the apex, the latter truncate; disk finely, rather sparsely punctulate, also very coarsely, somewhat closely punctato-foveate, a narrow median line impunctate. *Elytra* nearly two and one-half times as long as wide, three times as long as the prothorax and scarcely perceptibly wider than the latter; sides parallel and straight, narrowly parabolic at apex; disk with unimpressed rows of moderately coarse, not very distant punctures which become much smaller toward apex, where also the first and second series become slightly impressed;

intervals extremely minutely, feebly punctulate; scutellar impression very feeble. *Abdomen* rather closely but feebly punctato-rugulose, with widely scattered coarser punctures toward base, sparsely clothed with rather long hair, denser laterally toward apex. *Legs* short and decidedly slender, very sparsely pubescent. Length 5.8 mm.; width 1.6 mm.

Texas (Fort Worth).

The slender cylindrical form, very arcuate beak, lateral vitta and small size of this species are characters which will render it easily identifiable. It is not closely comparable with any other known to me. One specimen.

10 **L. marginatus** Say.—Descr. of Curc. of N. Am., p. 13; *sylvius* Lec. nec Boh.: Proc. Am. Phil. Soc., XV, p. 156.

Pennsylvania—LeConte; Iowa. The description of Say applies almost completely to the species identified by LeConte as *sylvius* Boh., and, as Boheman's description of *sylvius* will not answer at all for this form, especially in the elongate form of the body, very long beak and remote coarse variolate pronotal punctuation, there can be but little doubt that the synonymy proposed is correct. *Marginatus* is a small species; rather robust and elliptical in outline, with the vestiture sparse and more or less mottled above, longer on the abdomen where it is very dense and conspicuous along the lateral margins of the last three segments. The scutellar impression of the elytra is large, deep and conspicuous, this character being especially alluded to by Say both in his diagnosis and description. Length 6.7–8.2 mm.; width 2.3–3.0 mm.

11 **L. musculus** Say.—Descr. of Curc. of N. Am., p. 14; *punctinasus* Lec.: Proc. Am. Phil. Soc., XV, p. 157.

New Jersey to Texas and Colorado. Varies considerably in size and somewhat also in the degree of acuteness of the elytral apices. The form is rather stout and elongate-oval, moderately shining, the prothorax short, transverse and more or less impressed in the middle throughout the length, the vestiture short, not very dense and more or less feebly mottled on the elytra. The type of *punctinasus* is a small male of this species. Length 7.5–10.8 mm.; width 2.8–3.9 mm.

12 **L. parvus** Lec.—Proc. Am. Phil. Soc., XV, p. 157.

California (San Francisco); not common. Resembles *marginatus* in its robust elliptical outline but is still shorter and broader,

and with obsolete scutellar impression of the elytra; the abdomen is not margined at the sides with denser pubescence. Length 6.5–6.8 mm.; width 2.5 mm.

13 **L. pygmæus** n. sp.—Elongate, elliptical, moderately slender, convex, polished, black throughout, the tarsi rufo-piceous; antennæ rufous with darker club; vestiture short, sparse, feebly mottled on the elytra. Head convex, finely punctate; beak slender, cylindrical, strongly arcuate, finely, densely punctate, more strongly so in the male, in the latter sex very short, not quite as long as the prothorax, much longer in the female, the scrobes extending rather beyond apical third in both sexes. Prothorax short, one-half to two-thirds wider than long, the base much wider than the apex and broadly, feebly cusped in the middle; apex truncate; sides strongly convergent from base to apex and rather strongly arcuate; disk with a small feeble basal impression, finely, feebly, sparsely punctulate and with coarse remote variolate punctures, denser at the sides where there is a very narrow feebly marked line of denser pubescence. Elytra twice as long as wide, just visibly wider than the prothorax, rather narrowly parabolic at apex; sides parallel and very slightly arcuate especially behind; disk with a broad and feeble scutellar impression and with completely unimpressed rows of distant punctures, which are coarse toward base but gradually very fine toward apex; intervals extremely minutely, feebly, sparsely punctulate. Abdomen more densely clothed with longer hair. Legs short but rather slender, sparsely pubescent. Length 5.0–6.2 mm.; width 1.8–2.2 mm.

Kansas.

The single pair before me indicates a species somewhat allied to *musculus*, but with more arcuate and less densely punctured beak and more coarsely and remotely punctured pronotum, the latter being only impressed near the base; the size is very much smaller, it being in fact the smallest species known to me from our fauna.

14 **L. concavus** Say.—Descr. Curc. N. Am., p. 14; *rectus* Lec.: Proc. Am. Phil. Soc., XV, p. 158 (♀).

New York to Idaho. A rather large species, not very densely and nearly evenly clothed with very short robust hairs, and generally densely covered with yellow pollen. The prothorax is broadly impressed along the middle, strongly so near the base, and is from one-third wider than long to nearly as long as wide. The beak is rather longer than the prothorax in the male and much longer in the female, the antennæ inserted at apical third. The female, although larger than the male, is relatively more slender, and the type of *rectus* is an unusually small specimen of the former sex, in which the prothorax is only slightly wider than long, but com-

pletely similar in every other detail of structure. The male associated with the female type of *rectus* is a normal male of *concausus*. Length 9.5–13.8 mm.; width 3.0–4.6 mm.

15 **L. mucidus** Lec.—Proc. Am. Phil. Soc., XV, p. 158; *cinerarius* Dej. Cat.: 3 ed., p. 296.

Indiana; Illinois. This species is about as long as *concausus* and distinctly more robust, also with a shorter, stouter beak, in which the sexual differences are much less pronounced. The vestiture is cinereous, extremely short, moderately dense, almost evenly distributed and squamiform, and it may be distinguished at once from *concausus*, not only by this character, but by the feebly elevated rostral carina. The prothorax is almost identical in outline with that of *concausus* but is a little shorter. Length 12.0–15.3 mm.; width 3.8–5.2 mm.

16 **L. soror** n. sp.—Rather robust and convex, parallel, moderately shining, black throughout, the antennæ piceous; vestiture yellowish, dense, feebly, coarsely mottled on the elytra, very short, somewhat dense, squamiform; surface densely pollenose. *Head* and beak finely but strongly, evenly, moderately densely punctate, the beak in the female slender, rather arcuate, cylindrical, shining, very slightly longer than the prothorax, the antennæ inserted at two-fifths from the apex. *Prothorax* one-fourth wider than long, the apex truncate, three-fifths as wide as the base, the latter broadly, distinctly, angularly lobed or cusped in the middle; sides visibly convergent and feebly arcuate from the base, rather abruptly narrowed or constricted in apical fourth; disk with a large deep ovoidal impression extending from the base to apical fourth, the sculpture feebly rugulose and consisting of moderately coarse and finer punctures densely intermingled, the pubescence denser laterally and in the depression. *Elytra* more than twice as long as wide and between three and four times as long as the prothorax, subequal in width to the latter, rather obtusely ogival and minutely notched at apex; sides parallel, nearly straight; disk broadly, strongly impressed in the middle at base, having rows of moderately coarse distant punctures, the intervals minutely, densely, indistinctly punctulate. *Abdomen* rather densely clothed with longer pubescence. *Legs* short but not very robust, sparsely clothed with short pubescence. Length 10.5 mm.; width 3.6 mm.

Montana (Helena). Mr. H. F. Wickham.

Allied to *concausus* but diverging in many decisive characters, among which may be mentioned the shorter beak of the female and the difference in form, depth and extent of the pronotal impression.

17 **L. laramiensis** n. sp.—Rather stout, parallel, somewhat depressed above along the middle, black throughout, the antennæ scarcely paler; integu-



ments almost completely concealed by the extremely dense vestiture, which is pale yellowish in color and rather long throughout. *Head* and beak extremely densely clothed throughout, when denuded minutely and densely punctate, the beak in the male a little shorter, in the female distinctly longer, than the prothorax, in the latter sex often denuded in apical half, cylindrical, feebly arcuate, not in the least carinate; the antennæ inserted near apical third (male), or just before the middle (female). *Prothorax* but slightly wider than long, the apex feebly arcuate, scarcely more than one-half as wide as the base, the latter almost transverse, very feebly lobed in the middle; sides strongly convergent from base to apex and rather strongly, evenly arcuate, sometimes feebly constricted near the apex in the female; disk with a rather large and deep basal impression, minutely, extremely densely punctulate and with rather coarse, widely and very unevenly dispersed punctures, the entire sculpture including the punctures almost completely concealed by the vestiture. *Elytra* distinctly more than twice as long as wide, about three times as long as the prothorax and nearly one-fourth wider than the latter, the humeri oblique; sides parallel and straight; apex broadly rounded, minutely notched; disk with unimpressed rows of not very coarse, rather distant punctures. *Abdomen* very densely, evenly clothed with long hair, sparsely speckled toward base with subdenuded punctures, each bearing a longer and coarser seta. *Legs* moderately long and stout, very densely clothed throughout. Length 9.0–11.8 mm.; width 3.0–4.0 mm.

#### Wyoming.

This species is represented before me by a large series from several localities in Wyoming, and is apparently plentiful but local; it is commonly confused in cabinets with *mixtus*, a widely different species with strongly carinate beak.

18 ***L. mixtus*** Lec.—Proc. Am. Phil. Soc., XV, p. 416.

Colorado—LeConte. I have but little to add to the full and satisfactory original description; the prothorax, however, is stated to be "scarcely longer than wide," whereas it is not quite as long as wide; this overstatement of the relative length of the prothorax seems to be a constant personal equation in most of Dr. LeConte's descriptions, and due allowance must be made for it in identifications. *Mixtus* is a remarkable species, represented as far as known to me by the unique specimen in the LeConte cabinet; the pubescence forms a broad and rather well-defined marginal vitta along the prothorax and elytra. Length 10.0 mm.; width 3.2 mm.

19 ***L. sobrinus*** n. sp.—Rather slender and convex, somewhat shining, black throughout, the antennæ dark rufous, the club dusky; vestiture sparse, forming a dense lateral pronotal vitta and also somewhat broadly condensed along the sides of the elytra, on the disk of the latter sparse, very short and

squamiform, with small and widely dispersed denser nuclei, fine and evenly distributed on the median parts of the pronotum, cinereous throughout. *Head* and beak very sparsely pubescent, finely but very deeply and strongly, densely punctate, the beak very short, scarcely three-fourths as long as the prothorax, slightly arcuate, distinctly flattened above and with an extremely fine and feeble median carina in basal two-thirds; antennæ inserted just beyond the middle, the scrobes extending rather beyond apical third. *Prothorax* but little wider than long, the apex subtruncate, nearly two-thirds as wide as the base, the latter broadly and obtusely angulate; sides distinctly convergent from the base to apical fourth, the apex slightly constricted; disk very densely, rather strongly punctulate and also somewhat densely, moderately coarsely punctate, feebly, narrowly impressed in the middle toward base. *Elytra* between two and three times as long as wide, three times as long as the prothorax, and, behind the middle, a little wider than the latter; sides subparallel, the apex gradually somewhat narrowly rounded and with a distinct angulate sutural notch; disk feebly impressed in the middle toward base, with unimpressed rows of deep, rather distant punctures which are coarse toward base but fine near the apex. *Abdomen* with longer hair, denser on the last three segments. *Legs* short but not very stout, sparsely pubescent, the femora subannulate with longer and denser pubescence at apical third. Length 7.8 mm.; width 2.4 mm.

Texas.

A rather small species allied to *mixtus*, but differing in its narrower form, convergent sides of the prothorax and finer, denser, less variolate punctuation of the pronotum. In *mixtus* the sides of the prothorax are parallel and rather distinctly arcuate, the apex being rather abruptly and strongly constricted, somewhat as in *sylvius* and *scrobicollis*; the elytral vestiture is long and hair-like, with intermixed erect setæ in that species, while in *sobrinus* it is very short, sparser and squamiform, without trace of intermixed setæ. The single specimen before me is of uncertain sex, but judging by the short beak, is probably a male.

20 **L. sylvius** Boh.—Sch. Gen. Curc., VII, 1, p. 430; *scrobicollis* Lec. nec Boh.: Proc. Am. Phil. Soc., XV, p. 159.

Kentucky; Georgia; "Carolina et Pensylvania"—Bohem. A rather small, widely diffused species, readily distinguishable by its very long slender beak, parallel form of body, strongly constricted apex and extremely coarse remote and variolate punctures of the prothorax. In all of these characters it agrees rigorously with the long description of Boheman, who states that in the female the beak is as long as the head and prothorax. The expression "thorace remote profunde varioloso-punctato" could not be applied in any sense

to the species identified by Dr. LeConte as *sylvius*, this, as before stated, being the same as *marginatus* Say. Length 6.8–9.7 mm.; width 1.9–3.0 mm.

The dehiscent elytra, spoken of by Boheman, is an accidental character, and among the specimens before me, I have one which is similar to his type, also a specimen of *laramiensis* in which the elytra become broadly dehiscent in apical fifth or sixth, that species having, normally, only a very small sutural notch.

21 **L. scrobicollis** Boh.—Sch. Gen. Curc., III, p. 84; *lateralis* || Say, Descr. Curc. N. Am., p. 14; *lasicollis* Lec.: Proc. Ac. Nat. Sci. Phila., 1858, p. 78; Proc. Am. Phil. Soc., XV, p. 160.

Virginia; Florida; Texas. This species greatly resembles the preceding, especially in the very coarse variolate punctures and constricted apex of the prothorax, and in size, but departs widely in the much shorter and stouter beak. The beak in both sexes is much shorter than the prothorax and is very much more robust and coarsely punctured than in *sylvius*. Length 6.5–9.5 mm.; width 1.9–3.0 mm.

22 **L. perforatus** Lec.—Proc. Am. Phil. Soc., XV, p. 159.

California (Lake Co., San Francisco, Tehachapi Pass and Yuma). A rather slender species, closely resembling the two preceding in size and many other more important characters. The beak is slender, equal in length to the prothorax in the female and a little shorter in the male. There is a distinctly marked tumid or umbonate spot on the disk of each elytron near apical fifth. The three specimens from Yuma are rather larger than those from the coast regions and probably indicate a varietal form with still longer beak. Length 6.8–10.3 mm.; width 1.9–2.8 mm.

23 **L. semivittatus** n. sp.—Parallel, convex, moderately slender, black throughout, the antennæ scarcely paler, the elytra feebly shining through the dense vestiture which is rather long and pubiform, forming three vittæ on each, the narrow vitta of the third interval always distinct throughout the length, joining the broad submarginal vitta at apical sixth, the vitta on the fifth interval often very feebly defined. *Head* transversely but very feebly impressed between the eyes; beak toward base and the head coarsely, sparsely punctate, the former rather robust, about three-fourths as long as the prothorax in the female and still shorter in the male, very feebly arcuate; antennæ in both sexes inserted at about the middle. *Prothorax* almost as long as wide, subquadrate; sides parallel and feebly arcuate, very strongly and abruptly

constricted in apical fifth, the apex truncate, three-fifths as wide as the base, the latter broadly, obtusely angulate; disk feebly impressed in the middle toward base, finely, rather strongly punctulate, also very coarsely variolate, the punctures sparse; pubescence forming a broad oblique marginal and narrow median vitta. *Elytra* a little more than twice as long as wide, not more than two and one-half times as long as the prothorax and slightly wider than the latter, rather narrowly parabolic at apex, without distinct sutural notch; sides subparallel; disk with feeble scutellar impression, and unimpressed rows of coarse deep rather close-set punctures. *Abdomen* with longer pubescence, denser behind. *Legs* short, moderately slender, somewhat sparsely pubescent, the femora subannulate with denser hairs near the apex, the posterior tibiae extremely short when compared with the corresponding femora. Length 6.4–8.5 mm.; width 1.8–2.9 mm.

Arizona; Utah.

A good series before me shows that while allied rather closely to *perforatus*, the present species differs conspicuously in the shorter thicker beak, more robust form of the body and different elytral ornamentation, this latter being however an amplification and development of the vague pattern observable in well-preserved examples of *perforatus*. In the latter, even in perfect specimens, the third interval is never vittate except behind the middle and near its point of juncture with the marginal vitta, the fifth never vittate, and the somewhat shorter vestiture is more or less confusedly and strongly mottled toward the sutural parts of the disk; this mottling is never so distinctly observable in *semivittatus* and is generally completely invisible.

24 **L. macer** Lec.—Proc. Am. Phil. Soc., XV, p. 160.

The specimens before me are from Illinois, Kansas, and Utah. *Macer* is a large and conspicuous species, of slender cylindrical form, shining integuments and sparse, finely and distinctly nucleated vestiture which becomes denser along the sides of the upper surface. The beak is longer and more developed than in any of our other species, in the female being nearly twice as long as the prothorax, and it differs also from any other known to me in the basal constriction of the elytra. Length 14.5–18.0 mm.; width 3.8–4.8 mm.

25 **L. jülichii** n. sp.—Rather stout, elongate, subelliptical, moderately convex above, shining, black throughout, the antennae dull piceo-rufous with blackish club; vestiture very short, squamiform, sparse and more or less finely, sparsely mottled, gradually denser toward the sides of the upper surface and subdenuded near the lateral thoracic vitta. *Head* and beak rather finely but



strongly, sparsely punctate, finely, sparsely pubescent, with a strong interocular fovea; beak cylindrical, somewhat robust, feebly arcuate, fully as long as the prothorax, the antennæ inserted near apical two-fifths, the scrobes extending beyond apical third. *Prothorax* conical, but slightly wider than long, the sides strongly convergent from base to apex and straight; apex truncate, barely three-fifths as wide as the base, the latter broadly, feebly cusped in the middle; disk with a large deep rounded impression in basal two-fifths, finely but strongly punctulate, and with intermixed moderately large deep punctures, the sculpture somewhat rugulose, a narrow median line more or less impunctate. *Elytra* between two and three times as long as wide and about three and one-half times as long as the prothorax, at the tumid humeri much wider than the base of the latter, gradually, acutely ogival and rather narrowly and deeply notched at apex; sides nearly parallel and straight in basal two-thirds; disk with unimpressed rows of rather small widely distant punctures. *Abdomen* somewhat sparsely clothed with much longer pubescence. *Legs* moderate in length, rather sparsely clothed with short coarse hairs, the femora long, feebly annulate at apical third. Length 11.0–11.2 mm.; width 3.4 mm.

New Jersey. Mr. W. Jülich.

The two specimens before me are apparently males, and in the female the beak is probably much longer. This is a conspicuous species, not at all closely allied to any other and recognizable at once by its prominent and tumid humeri, conical, deeply impressed prothorax and gradually, very acutely ogival elytral apex.

26 ***L. luculentus*** n. sp.—Slender, elongate-elliptical, convex, strongly shining, black throughout, the antennæ, excepting the club, piceo-rufous; vestiture very short, squamiform, sparse, remotely and finely nucleated on the elytra, finer but sparse on the anterior portions and but slightly denser on the flanks of the prothorax. *Head* and beak finely, sparsely punctate, broadly, transversely impressed between the eyes and with a small deep rounded interocular fovea, also another, feebler and more elongate between the points of antennal insertion; beak cylindrical, feebly arcuate, rather slender, shorter than the prothorax in both sexes; antennæ inserted a little beyond the middle. *Prothorax* conical, scarcely perceptibly shorter than wide, the sides strongly convergent from base to apex and broadly, feebly, evenly arcuate; apex truncate, three-fifths as wide as the base, the latter broadly, rather feebly cusped; disk rather feebly, narrowly impressed in the middle throughout the length, the impression becoming very deep near the base, minutely, not very densely punctulate and also sparsely and more coarsely punctate, the larger punctures comparatively fine. *Elytra* more than twice as long as wide, about three times as long as the prothorax and just visibly wider than the latter, rather abruptly but narrowly parabolic at apex and with a small broadly angulate sutural notch; sides parallel and straight, becoming very feebly arcuate toward base; disk with unimpressed rows of

moderately coarse, deep, widely but unevenly spaced punctures, each elytron with a more distinct median subdenuded area just behind the middle. *Abdomen* mottled with dense and sparse patches of long white pubescence. *Legs* sparsely pubescent, the femora narrowly and densely annulate at apical third. Length 8.4–9.4 mm.; width 2.5–2.7 mm.

Florida (Lake Worth). Mr. W. Jülich.

Rather closely allied to *fossus*, and resembling that species in general form and in the more subdenuded discal spot of the elytra, but differing decidedly in its more slender form, much more elongate and conical prothorax, narrowly impressed in the middle throughout the length, in its shorter, more squamiform, very much sparser and less mottled vestiture, and in the sparse punctuation of the beak in both sexes. A female of this species was placed by LeConte with the unique type of *fossus* under the impression that it might be the female of that species; but, as I have before me both sexes, it is readily seen to be quite different.

**27 L. nitidulus** n. sp.—Moderately slender, convex, elongate-oval, strongly shining, black throughout, the antennæ dull rufo-piceous; vestiture sparse, pubiform on the anterior parts, very short and coarse on the elytra where it is distinctly nucleated or mottled, rather denser near the sides of the body, with a broad subdenuded line bordering the denser lateral vitta and continuous throughout the pronotum and elytra. *Head* and beak rather finely but strongly, sparsely punctured, not transversely impressed between the eyes but with a deep elongate interocular fovea, and another between the antennæ; beak rather long and slender, cylindrical, feebly arcuate, equal in length to the prothorax, with a narrow impunctate median line; antennæ inserted at the middle, the scrobes extending fully to apical two-fifths. *Prothorax* but slightly wider than long, the sides convergent from base to apex, feebly arcuate, and slightly constricted near the apex, the latter truncate, three-fifths as wide as the base which is broadly, feebly cusped in the middle; disk finely, moderately densely, strongly punctulate and with somewhat sparse deep and moderately coarse punctures, the basal impression small but deep, just before the scutellum, the latter indistinct. *Elytra* about three times as long as the prothorax and scarcely at all wider than the latter, nearly two and one-half times as long as wide, rather gradually and narrowly parabolic and broadly feebly notched at apex; sides parallel and straight, the humeri very feebly, longitudinally tumid; disk rather broadly and distinctly impressed in the middle at base, and having rows of coarse deep, rather distant punctures, the series becoming impressed near the apex. *Abdomen* clothed with longer hair, very sparsely except at the sides of the last three segments, where it becomes dense. *Legs* moderate, sparsely clothed with short very fine hair, denser toward the under surface of the femora at apical third. Length 9.3 mm.; width 2.8 mm.

## Indiana?

A single female from the Levette cabinet without definite indication of locality, but probably taken in or near that which is above suggested. The species is quite different from any other which I have seen, although somewhat allied to *jülichii*; it may however be easily distinguished from the latter by its narrower, more convex form, the elytra being subequal in width to the prothorax, and by the very small basal impression of the pronotum.

28 **L. fossus** Lec.—Proc. Am. Phil. Soc., XV, p. 416.

Florida (Enterprise), Mr. Schwarz—Cab. LeConte. The original male type is the only representative known to me. The species is one of a small group of species of peculiar habitus and apparently confined to the peninsula of Florida, although it is quite possible that others exist in Cuba, from which region this peculiar type may have formerly extended northward. The beak is short, scarcely as long as the prothorax, feebly arcuate, more or less flattened above and very densely punctured, without trace of a median impunctate line; the prothorax is distinctly wider than long, with a rather large and very deep basal impression which does not extend at all beyond basal third. Length 8.4 mm.; width 2.6 mm.

29 **L. obesulus** n. sp.—Rather robust, somewhat flattened above, elliptical, very strongly shining, black throughout, the antennæ rufescent toward base; vestiture very short, sparse, plumbeo-cinereous, squamiform, not appreciably denser toward the sides of the body except very slightly so on the flanks of the pronotum, almost evenly distributed on the elytra, the nucleated patches being ill-defined, extremely small and remotely dispersed, the scales subrecumbent and bent downward toward their apices. *Head* and beak rather finely but strongly, somewhat densely punctate, with a feeble transverse impression between the eyes and a small deep interocular fovea; interantennal fovea entirely obsolete; beak robust, feebly arcuate, slightly flattened, not quite as long as the prothorax, with a narrow and well-defined median impunctate line; antennæ inserted near apical third. *Prothorax* conical, nearly one-fourth wider than long, the apex truncate, scarcely more than one-half as wide as the base, the latter strongly, rather narrowly and abruptly cusped in the middle; sides strongly convergent from base to apex, distinctly, almost evenly arcuate throughout; disk with a large deep and somewhat irregular basal impression, which does not extend beyond the middle, finely but strongly, rather closely punctulate and with very sparse punctures which, although decidedly coarser, are still fine. *Elytra* scarcely more than twice as long as wide, fully three times as long as the prothorax, and, in the middle,

nearly one-fourth wider than the latter; apex gradually parabolic in apical third, with a small angulate sutural notch; sides parallel and nearly straight, arcuate and feebly convergent toward base, the humeri very slightly tumid but not prominent; disk with unimpressed series of rather fine distant punctures. *Abdomen* somewhat evenly, moderately densely clothed with longer cinereous hairs and thickly speckled with small subdenuded punctures, each of which bears a short robust seta. *Legs* moderately pubescent, the femora annulate at apical third. Length 10.2 mm.; width 3.5 mm.

Florida.

The unique type is a male and represents a species belonging to the same group as *fossus* and *luculentus*. It differs greatly however from either of these in its robust form, and, from *fossus* in addition, by its shorter, sparser, much more squamiform and inconspicuous vestiture, in the impunctate line and obsolete interantennal fovea of the beak, and in its larger size; from *luculentus* it differs also in the entirely basal impression of the pronotum.

30 ***L. terminalis*** Lec.—Proc. Am. Phil. Soc., XV, p. 157.

Long Island; Indiana; Illinois. A rather common and well-known species, distinguishable by its pale brownish-rufous coloration, polished integuments, sparse, finely, distantly and feebly mottled vestiture and large deep sutural notch at the apex of the elytra, the apices appearing as if produced, and each more or less broadly angulate. The differences alluded to by LeConte, in the lustre and pubescence of the male and female, are not very pronounced. The beak in the male is fully three-fourths as long as the prothorax, and in the female just visibly shorter than the latter. Length 9.3–11.8 mm.; width 3.0–3.5 mm.

31 ***L. sexualis*** n. sp.—Elongate-suboval, convex, strongly shining, rather pale brownish-rufous in color, the anterior parts often blackish-piceous; vestiture short but not squamiform, very sparse, slightly denser on the flanks of the pronotum and feebly and indefinitely mottled on the elytra. *Head* and beak very finely, moderately densely punctured, the latter more strongly and densely so than the former in the male but not in the female; beak feebly arcuate, cylindrical, short, stout and scarcely three-fourths as long as the prothorax in the male, very slender, one-half longer, and distinctly longer than the prothorax in the female; antennæ inserted distinctly before the middle in both sexes. *Prothorax* very nearly as long as wide, the truncate apex nearly three-fifths as wide as the base, the latter broadly, obtusely and feebly cusped in the middle; sides convergent from base to apex, broadly, almost evenly arcuate, sometimes broadly, feebly



subconstricted near the apex in the female; disk more or less broadly impressed throughout the length, deeply so toward base, finely, strongly punctulate, sparsely so toward apex, very densely toward base, the small punctures intermixed with moderately coarse ones which are also dense toward base. *Elytra* but slightly more than twice as long as wide, three times as long as the prothorax, and, at apical third, one-third wider than the latter, at base subequal in width to the thoracic base; sides feebly divergent and nearly straight from the base to apical third, then abruptly strongly convergent and nearly straight to the apex which is acutely angulate but with a large angulate sutural notch, the individual apices narrowly rounded; disk with rows of coarse approximate punctures, the series not impressed but becoming distinctly so and finer toward apex. *Abdomen* rather sparsely and evenly clothed with longer but rather short pubescence. *Legs* bright rufous, short, not very stout, sparsely punctulate and pubescent. Length 7.4–8.5 mm.; width 2.3–2.8 mm.

Texas (Austin).

This species is related to *terminalis*, especially in color, pubescence and general form of the elytral apices, but differs greatly in its smaller size, much more dilated elytra at apical third, in the rounded elytral apices, coarse approximate elytral and dense pronotal punctures, and in the extremely pronounced sexual differences in the beak.

## APPENDIX.

## NOTES.

1—Shortly after the description of *Thyce blaisdelli* (*ante*, p. 19) had been printed, I received a large series from Dr. Blaisdell, including numerous males and two females. The latter sex is nearly similar in form and size to the male, but has the prothorax somewhat smaller, the entire upper surface of the body being clothed sparsely with extremely short fine recumbent hairs; the fourth joint of the maxillary palpi is about twice as long as wide, deeply, narrowly channeled throughout its length, and the antennal club is about two-thirds as long as the stem; the tubercle of the vertex is large and rather feeble. The female referred to under the description of *blaisdelli*, does not belong to this species but to another, the male of which has probably not yet been discovered.

2—From specimens recently sent me by Mr. Champion, I find that *Blapstinus substriatus* was correctly identified in my recent revision of that genus. This species has therefore an exceptionally extended distribution.

3—There is before me a good series of *Palorus depressus* Fab., taken in Kansas. This European species is apparently thoroughly acclimated in this country as well as Mexico, and should be inserted in our lists.

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# ANNALS

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### III.—*The American Species of the Genus Anemone and the Genera which have been referred to it.*

BY N. L. BRITTON.

Read October 12, 1891.

The genus *Anemone* as recognized by Bentham and Hooker in 1862 (Gen. Pl., i, 4), contained on their estimate about 70 species; Durand (Index. Gen. Phanerog. 1 (1888) estimated that the number then known was about 85, while Prantl (in Engler and Prantl, Naturl. Pflanzenfamilien, Lieferung 19, p. 61, 1888), placed the number at 90, including in this estimate the 5 known species of *Knowltonia*; so we may take Durand's estimate as the last one made. It was monographed by Pritzel (Linnæa, xv, 561–698, 1841). The species are widely distributed in temperate and subarctic or alpine regions of both hemispheres. A few occur in warm temperate and tropical regions, but the group is essentially one of temperate climates; 13 occur in Europe, 15 in British India, especially in the Himalayas (Hooker, Fl. Brit. Ind., i, 7), 16 in China (Forbes and Hemsley, Journ. Linn. Soc., xxiii, 10), 2 in South Africa (Harvey and Sonder, Fl. Cap., i, 3), 1 in Australia (Bentham, Fl. Austral., i, 8). In the following pages 39 species are recognized as American, placed in six genera, all of which are kept in *Anemone* by Bentham and Hooker, Baillon, and Engler and Prantl.

There has been no agreement among authors as to the limits of the genus. Tournefort recognized *Anemone* and *Pulsatilla*. Linnæus in the earlier editions of his Genera Plantarum had *Hepatica*, *Pulsatilla*, and *Anemone*, but united them all in the first edition of his Species Plantarum. Adanson maintained *Anemone* and *Pulsatilla*. Jussieu united all three. Among more recent authors there has been equal difference of opinion. Ledebour (Fl. Ross., i, 13–23) maintained the three as distinct, and this view is accepted by Nyman (Consp. Fl. Europ., 2–4). Gray has recognized *Anemone*, *Pulsatilla* and *Hepatica* in the first four editions of his Manual and in his Genera Illustrata, but united *Pulsatilla* with *Anemone* in the fifth

edition. Watson reduced them to *Anemone* in his Bibliographical Index, but in the sixth edition of Gray's Manual retains *Hepatica* as a genus. Freyn, who has recently studied Ranunculacæ, considers *Pulsatilla* distinct (Deutsche Bot. Monats., viii, 78, 1890).

I am satisfied after a study of nearly all the described species that the first treatment of the group by Linnæus is the most satisfactory. There is perhaps less reason for keeping *Anemone* and *Pulsatilla* distinct than for separating *Hepatica*, but I find no transitions from *Pulsatilla* to *Anemone*, and it forms a very natural group of species both as to structure, habit, and geographical distribution throughout the north temperate zone.

As to the other genera referred to *Anemone* by recent authors I think them also clearly distinct. *Syndesmon*, Hoffm. (*Anemonella*, Spach), of eastern North America, has no close analogue in either *Thalictrum* or *Anemone*, to both of which it has been referred, and I entirely agree with Dr. Watson in keeping it as a genus, although under the older of the two generic names. *Barneoudia*, Gay, species of extra-tropical South America, are to me very different from any true *Anemone* or *Hepatica*, and very circumscribed in distribution. *Knowltonia*, of South Africa, referred to *Anemone* by Baillon and Engler and Prantl, but kept up by Bentham and Hooker, I regard as distinct for similar reasons.

The essential characters of the genera known to occur in America as understood by me may be indicated as follows:—

Achenia with long, plumose, persistent styles; outer stamens often sterile; involucre remote from the flower, 3-leaved; radical leaves digitately much divided .....1. **Pulsatilla.**

Achenia glabrous, pubescent, or woolly, with short, subulate, not plumose styles; stamens all antheriferous; involucre remote from the flower or flowers, 1-3-leaved, the leaves sessile or petioled; radical leaves various.

2. **Anemone.**

Achenia pubescent, short-beaked; stamens all antheriferous; involucre approximate to the flower, 3-leaved, calyciform, the leaves sessile; radical leaves petioled, 3-lobed or sometimes 5-7-lobed.....3. **Hepatica.**

Achenia? carpels densely villous-pubescent; style glabrous; filaments all antheriferous; involucre 0; leaves petioled, entire.....4. **Capethia.**

Achenia cylindric; style filiform; stigma papillose; outer stamens dilated and petaloid; involucre 5-6-leaved or 5-6-lobed, contiguous with the flower; radical leaves entire, lobed or bifid.....5. **Barneoudia.**

Achenia columnar, terete, deeply grooved, the stigma sessile and truncate; stamens all antheriferous; involucre distant from the flower, of 2-3, sessile, ternate, long-stalked leaflets; radical leaves 2-3-ternately compound.....6. **Syndesmon.**

1. **PULSATILLA**, L. Gen. Pl., 163 (1737).

1. ***Pulsatilla hirsutissima*** (Pursh).

*Clematis hirsutissima*, Pursh, Fl. Am. Sept., 385 (1814).

*Anemone Ludoviciana*, Nutt. Gen., ii, 20 (1818).

*A. Nuttalliana*, D.C. Syst., i, 193 (1818).

*A. Nuttallii*, Nutt., Journ. Acad. Phil., 1825, 158.

*Pulsatilla Nuttalliana*, Spreng. Syst., ii, 663 (1825).

*A. patens*, Hook., Fl. Bor. Am., i, 4 (1830), not L.

*Pulsatilla patens*, A. Gray, Gen. Ill., i, 18, t. 3 (1848), not Mill.

*A. patens*, var. *Nuttalliana*, A. Gray, Man. Ed. 5, 36 (1867).

*A. patens*, var. *hirsutissima*, Hitch., Trans. St. Louis. Ac., v, 482 (1891).

Villous, 12–40 cm. high. Leaves much divided into narrow, linear, acute lobes, the radical on slender petioles, those of the involucre similar, sessile, erect or ascending; sepals ovate-oblong,  $2\frac{1}{2}$ – $3\frac{1}{2}$  cm. long, bluish-purple; fruit a head of silky achenia, with long, plumose styles. After flowering the peduncle elongates, sometimes to 30–40 cm.

*Distrib.* Prairies of Illinois to Manitoba, west to the Rocky Mountains, north and northwest. Perhaps also in Siberia.

The plant differs constantly from the European *P. patens* (L.), in its narrower and usually longer leaf-segments, and smaller flowers. The type of *Clematis hirsutissima*, Pursh, is in the Herbarium of the Philadelphia Academy of Natural Sciences.

2. ***Pulsatilla occidentalis*** (S. Wats.).

*Anemone alpina*, Hook., Fl. Bor. Am., i, 5 (1830), not L.

*Anemone occidentalis*, S. Wats., Proc. Amer. Acad., xi, 121 (1876).

*Pulsatilla occidentalis*, Freyn, Deutsche Bot. Monats., viii, 78 (1890).

Rather stout, silky-villous, 15–50 cm. high, simple. Radical leaves long-petioled, biternate, the divisions deeply pinnatifid into usually incised, linear, acute lobes; leaves of the involucre similar, short-petioled; flower 15–40 mm. broad, peduncled, the peduncle much elongated in fruit; sepals 6 or 7, oval-obtuse, white or purplish at the base; receptacle conic, sometimes 4 cm. long; achenia oblong, somewhat pubescent, the persistent plumose styles reflexed, 2–4 cm. long.

The plant differs from the European *P. alpina*, as noted by Dr. Watson, in its more finely dissected leaves with narrower segments, and in its elongated receptacle. I have not seen true *alpina* from America.

*Distrib.* California: Mt. Shasta (Brewer, 1419); Lassen's Peak, Sierra Nevada (Lemmon, 954). Oregon: Mt. Hood (T. Howell). Washington: (Tweedy); Mt. Rainier (Piper). British Columbia:

Rocky Mts. (Drummond); Kicking Horse Lake, Lake Agnes, National Park, Mt. Queest, Kootanie Lake, and Selkirk Mts. (Macoun); Cascade Mts. (Lyell); near Lytton (Dieck, according to Freyn); Goose Creek Mts. (Bowman); Kootanie Pass (Dawson).

Type of *Anemone occidentalis*, S. Wats. in Herb. Gray.

## 2. **ANEMONE**, L. Gen. Pl., 163 (1737).

\* Achenia woolly-pubescent, numerous, densely capitate.

† Plants slender, usually low, 1-2-flowered.

‡ Stems mostly single from a tuberous root.

○ Flowers always solitary.

+ Radical leaves or some of them simply ternate.

### 1. **Anemone decapetala**, Ard.

*A. decapetala*, Ard., Spec. Bot., ii, xxvii, t. 12 (1764).

*A. trilobata*, Juss., Ann. Mus., iii, 247, t. 21, f. 3 (1804).

*A. heterophylla*, Nutt. in T. & G. Fl. N. A., i, 12 (1838).

*A. Berlandieri*, Pritz., Linnæa, 1841, 628.

*A. Caroliniana*, var. *heterophylla*, T. & G. Fl. N. A., i, 12 (1838).

*A. decapetala*, var. *heterophylla*, Brit. & Rusby, Trans. N. Y. Ac. Sci., vii, 7 (1887).

Appressed pubescent or glabrate, 10-30 cm. high. Stems single or very rarely two together from a globose or cylindric tuber; radical leaves slender-petioled, ternate, the divisions broad, ovate, oval or obovate, stalked or rarely sessile, thick, crenate or incised-obtuse,  $1\frac{1}{2}$ -2 cm. long; or some of them divided into linear-oblong segments; leaves of the involucre on short, broad petioles, cleft into linear or oblong-linear lobes; flower blue, 2-3 cm. broad; sepals usually 10-20, linear-oblong, obtuse, glabrous; peduncle much elongated in fruit; head of fruit cylindric,  $\frac{1}{2}$ -2 cm. long; style subulate, about 1 mm. long.

*Distrib.* Southern Brazil, Uruguay, the Argentine Republic, Mexico, and the southern United States. Brazil: (Arduino in Herb. Linn.); Minas-Geraes (Regnell); Rio Grande do Sul (St Hilaire). Uruguay: Montevideo (Courbon, 119). Argentine: La Plata (Commerson); Buenos Ayres (Tweedie). Mexico: Chihuahua (Torrey fide Hemsley). United States: Arkansas (Nuttall); Texas (Berlandier, 193, 1453, 1891; Reverchon, 4; Wright; Miss Croft; Merrill); American Plains (Hall and Harbour, 6; Buckley; Trecul, 1493); Louisiana (Hale); Alabama (Buckley).

The species shares with a considerable number of other plants the peculiarity of inhabiting the southern United States and Mexico, and extra-tropical eastern South America.



Type of *A. decapetala*, Ard., in Herb. Linn.; type of *A. trilobata*, Juss., in Herb. Mus. Paris; type of *A. heterophylla*, Nutt., in Herb. Col. Coll.; type of *A. Berlandieri*, Pritz. in Herb. Delessert.

++ Radical leaves repeatedly ternately divided.

+ South American.

## 2. *Anemone tridentata*, Vahl.

*A. tridentata*, Vahl, Symb., iii, 74, t. 65 (1794).

*A. fumariæfolia*, Juss., Ann. Mus., iii, 247, t. 20, f. 2 (1804).

Erect, slender, more or less appressed-pubescent, 6–45 cm. high. Radical leaves slender-petioled, repeatedly divided into oblong or linear, acute, dentate or entire segments; leaves of the involucre sessile, similarly divided into narrowly linear or filiform segments; flower solitary, white (?), 12–25 mm. broad; sepals 5–16, linear-oblong, obtuse or obtusish; head of fruit 16–25 mm. long; style short.

*Distrib.* Southern Brazil, Uruguay, the Argentine Republic, and eastern Chili and Bolivia. Brazil: (St. Hilaire; Sellow, 1161). Uruguay: Montevideo (Commerson; Courbon, 120; Fox, 366; Gibert, 141; Lorentz, 1052; Gillies; King). Argentine: (Hieronymus, 162). Chili: (Lechler, 2798); Nuble (Philippi). Bolivia: Tomina (Weddell); La Banca (Pearce); Sorata (Mandon, 868); La Paz (Rusby, 1753).

Closely related to *A. decapetala*, differing in its finely divided radical leaves, which are often of the aspect of those of some *Thalictrums*.

I have not seen Vahl's specimen, but his figure and description are entirely satisfactory. The type of *A. fumariæfolia*, Juss., is in the Herbarium of the Musée d'Histoire Naturelle at Paris.

+ + North American.

## 3. *Anemone Caroliniana*, Walt.

*A. Caroliniana*, Walt., Fl. Car., 157 (1788).

*A. tenella*, Pursh, Fl. Am. Sept., ii, 387 (1814).

*Hartiana*, Raf. Neogen. 2 (1825).

Appressed-pubescent or glabrate, slender, erect, 10–25 cm. high, from a globose or slightly elongated tuber. Radical leaves petioled, ternate, the divisions short-stalked or sessile, cleft or pinnatifid into linear or oblong, sometimes cuneate lobes and segments; leaves of the involucre similarly divided on short, broad petioles or sessile; flowers purple or nearly white, 1.5–3 cm. broad; sepals 10–20, linear-oblong, obtuse, more or less pubescent on the exterior; head of fruit ovoid,  $1\frac{1}{2}$ –2 cm. long; style subulate, usually less than 1 mm. long.

*Distrib.* Illinois to Nebraska, south to Georgia, Alabama, Louisiana, and Texas.

This has been referred by nearly all recent American authors, myself included, to *A. decapetala*, but erroneously.

The type does not exist in Walter's Herbarium at the British Museum of Natural History, but his description is satisfactory.

oo Flowers usually 2, the second peduncle involuclate.

#### 4. *Anemone sphenophylla*, Poepp.

*A. sphenophylla*, Poepp., Fragm. Syn., 27 (1833).

*A. bicolor*, Poepp. in Herb. Distr., No. 150.

*A. Chilensis*, Spreng. ex Eichl., Fl. Bras., xiii (I), 152 (name only).

*A. macrorhiza*, Domb. ex Eichl., loc. cit. (name only).

*A. bilobata*, Phil., Cat. Pl. Vasc. Chil., 5 (?), (name only).

Erect, more or less pubescent, 10-60 cm. Radical leaves slender-petioled ternately divided, the divisions obovate, obtuse, cuneate at the base, variously lobed and cleft; leaves of the involucre short-petioled or sessile by a narrowed base, palmatifid into linear or oblong acute segments; flowers commonly 2 (1-3), blue, the first peduncle naked, the subsequent ones involuclate; sepals oblong-oval obtuse, 1-1.5 cm. long, pubescent on the outer side; head of fruit ovoid or cylindric, 2-4 cm. long; achenia densely woolly; style very short.

Type in Herb. Mus. Hist. Nat. Paris.

The species has usually been referred to *A. decapetala*, but is in my judgment distinct, sharing the peculiarity of so many plants of eastern and western America in being closely related but different.

*Distrib.* Chili and the southwestern United States. Chili: (Poeppig, 151 (type), 150; Bertero, 801, 46; Gaudichaud, 224; Gay, 30; Dombey; Cuming, 645; Philippi, 254; Bridges, 26; Lechler, 3295); Juan Fernandez (Reed). United States: Utah (M. E. Jones, 1607; Johnson; Parry, 1); New Mexico (Wright, 1304; Fendler, Mexican Boundary Survey, 8; near Silver City (Greene); Arizona: Sierra Tucson (Pringle); Verde River Mesa (Smart).

All the Chilian plants which have been referred to *A. decapetala* apparently belong to this species. The North American specimens appear to me to be identical with the Chilian.

- † † Stems single or several from a slender, woody rootstock.  
 o Radical leaves simply ternate, the divisions cuneate-obovate,  
 crenate or lobed.

5. ***Anemone parviflora***, Michx.

- A. parviflora*, Michx., Fl. Bor.-Am., i, 319 (1803).  
*A. cuneifolia*, Juss., Ann. Mus., iii, 248, t. 21, (1804).  
*A. trilobata*, Pers. Syn., ii, 97 (1807).  
*A. borealis*, Richards., Frank. Journ., Ed. 2, App. 22 (1823).  
*A. cuneata*, Schlecht., Linnæa, 1831, 574.  
*A. tenella*, Banks, ex Pritz., Linnæa, 1841, 632.

Sparingly hairy, 10–30 cm. high, from slender rootstocks. Leaves petioled, three-parted, the broadly wedge-shaped divisions obtusely lobed or crenate, those of the involucre nearly sessile, more deeply and narrowly lobed; flower  $2\frac{1}{2}$  cm. or less in diameter; sepals 5–8, oval, very obtuse, white; head of fruit short-oblong or globose, about 1 cm. long; style subulate, 1 mm. long.

*Distrib.* Anticosti, Labrador, Newfoundland, and Quebec, Lake Superior, Minnesota, Montana, Colorado, British Columbia, and in Arctic America generally to Alaska. Also in eastern Siberia.

Type of *A. parviflora*, Michx., in Herb. Michx.; type of *A. cuneifolia*, Juss., in Herb. Juss.; type of *A. borealis*, Richards., in Herb. Mus. Brit.

- o o Radical leaves ternately pinnatifid into linear lobes.

6. ***Anemone Drummondii***, S. Wats.

- A. Drummondii*, S. Wats., Bot. Cal., ii, 424 (1880).

Tufted, slender, erect, 12–22 cm. high, pubescent with long, appressed or slightly spreading hairs. Radical leaves slender-petioled, ternate, the divisions pinnatifid into linear, usually short, obtusish lobes and segments; leaves of the involucre similar, short-petioled; flowers 1–2, long-peduncled, when 2 the second peduncle involucellate about at the middle; flowers 1–2 cm. broad; sepals about 5, oval, obtuse, light blue, finely pubescent on the lower side; head of fruit ovoid, about 1 cm. long; achenia woolly-pubescent, 4 mm. long, tipped with a filiform style of nearly their own length.

Closely related to *A. Baldensis*, L., of Europe, differing especially in the long, filiform style.

*Distrib.* California: Sierra Co. (Lemmon); Lassen's Peak (Mrs. Austin); Scott Mt. (Greene, Lemmon); Castle Peak and Siskiyou Co. (Pringle). Oregon: Mt. Hood (T. Howell; Henderson). British Columbia: Rocky Mts. (Drummond, Richardson); Canmore, Lake Agnes, Kicking Horse Lake, and Mt. Aylmer (Macoun); N. Kootanie Pass (Dawson).

†† Plants tall, 2-several flowered (rarely 1-flowered).

‡ Lateral peduncles involuclate.

o Involucral leaves short petioled; leaf-segments narrow.

### 7. *Anemone multifida*, Poir.

*A. multifida*, Poir., Suppl. Lam. Encycl., i, 364 (1810).

*A. Hudsoniana*, Richards., Frank. Journ., Ed. 2, App. 22 (1823).

*A. Commersoniana*, D.C. ex Deless., Ic., i, 4, t. 17 (1820).

*A. globosa*, Nutt. ex Pritz., Linnæa, xv, 673 (1841).

*A. lanigera*, Gay, Fl. Chil., i, 22 (1845).

*A. sanguinea*, Pursh. ex Pritz., Linnæa, 1841, 672.

*A. narcissiflora*, H. & A. Bot. Beechey, 121, not L.

Silky-hairy, 15–45 cm. high, sparingly branched, the latter peduncles involuclate. Radical leaves long-petioled, five-parted, the cuneiform divisions cleft into linear, acute lobes; those of the involuclres short-petioled, more or less cuneate, otherwise similar; sepals 5–9, greenish or red (rarely yellow), oblong, forming a flower 12–25 mm. broad; head of fruit globose or oblong, 12–25 mm. long; achenia compressed, deusely woolly, tipped with the subulate styles.

*Distrib.* Anticosti, Hudson's Bay and New Brunswick to northern New England, west to northern Michigan, Minnesota, British Columbia, and Oregon, and in the Rocky Mountains south through Colorado to Arizona (Mearns); also at the sea-level at the Straits of Magellan. Cape Horn (Hahn, 79); Magellan (Guillon, Voyage de l'Astrolabe et de la Zélée); Magellan (Poeppig, 957, 159 in Herb. Distr.; Chili Austral (Gay, *A. lanigera*); Sandy Point (Cunningham, Lechler, 957); Port Famine (King). Pampas de Arquihua, base of the Andes, 400 ft. (Pearce).

Some of the specimens from the Straits of Magellan are more woolly-pubescent than those from the United States, but otherwise I have detected no differences.

The type of *A. multifida*, Poir., is in Herb. Jussieu at Paris; that of *A. Hudsoniana*, Richards., in the Herbarium of the British Museum of Natural History; that of *A. lanigera*, Gay, in the general herbarium of the Paris Museum; and that of *A. globosa*, Nutt., in the Herbarium of Columbia College.

Small specimens without rootstocks may be mistaken for *A. Caroliniana*.



oo Involucral leaves slender-petioled; leaf-segments broad.

8. *Anemone Virginiana*, L.

*A. Virginiana*, L., Sp. Pl., 540 (1753).

*A. hirsuta*, Mönch., Meth. Suppl., 105 (1802).

*Abelemis petiolaris*, Raf. in Herb. Paris.

Hairy, 60–90 cm. high, stout, branching at the primary involucre, the lateral peduncles bearing secondary involucre. Radical leaves long-petioled, broader than long, three parted, the divisions broadly cuneate-oblong, variously cleft and divided into acute, serrate lobes; leaves of both primary and secondary involucre similar, on petioles 25–50 mm. long; sepals generally 5 [4–5], white or greenish, acute or obtuse; flower 20–40 mm. broad; head of fruit oblong, 20–30 mm. long; achenia compressed, woolly tipped with the persistent subulate styles, which are about  $1\frac{1}{2}$  mm. long.

*Distrib.* New Brunswick and Nova Scotia to South Carolina, west to Kansas and Manitoba and the Canadian Rocky Mountains (Lyell, Macoun).

Type of *A. Virginiana*, L., in Herb. Linn.

In the British Museum Herbarium are two sheets, one from the Chelsea Garden, 1722, the other from Kew, differing from typical *Virginiana* by longer petioles to the involucral leaves, and narrow leaf-segments. There is also a specimen of the same in the Herbarium of Columbia College, received from Meisner, grown in some European garden. I have not seen wild specimens which would exactly match these.

‡‡ Lateral peduncles usually naked; involucral leaves slender-petioled.

9. *Anemone cylindrica*, A. Gray.

*A. cylindrica*, A. Gray, Ann. Lyc. N. Y., iii, 221 (1836).

Silky-hairy throughout, 30–70 cm. high, branched at the involucre. Radical leaves tufted, long-petioled, broader than long, 3–5 parted, the divisions cuneate-obovate or cuneate-oblong, narrow; those of the involucre similar, on petioles about  $2\frac{1}{2}$  cm. long; sepals 5–6, greenish-white, oblong, generally obtuse; flowers about 2 cm. broad, on elongated, generally naked petioles; head of fruit cylindrical,  $2\frac{1}{2}$ –3 cm. or more in length; achenia compressed, woolly, tipped with the minute styles.

*Distrib.* New Brunswick, eastern New England, Ontario, New York, and northern New Jersey to Kansas and Manitoba; also in the Black Hills and Rocky Mountains south to Colorado, and New Mexico and in British Columbia (Macoun). Plants with

secondary involucre found in British Columbia (Macoun), at Presque Isle, Penn. (Garber), and at Lincoln, Neb. (Webber).

Type in Herbarium of Columbia College.

\* \* Apparently intermediate between divisions \* and \* \* \*; achenia numerous, densely capitate, but in the young state only slightly pubescent.

10. ***Anemone Tetonensis***, Porter, n. sp.

*A. Baldensis*, Hook., Fl. Bor. Am., i, 15 (1830)? not L.

Sparingly pubescent with long whitish hairs, especially at the involucre, erect, from a woody rootstock, 10–15 cm. high. Radical leaves slender-petioled, ternately divided, the divisions cleft into linear-oblong, obtusish lobes; leaves of the involucre similar, on petioles about 1 cm. long, their divisions and lobes somewhat broader; flowers 1–2, long-peduncled, 1–1½ cm. broad, red or pink; sepals 5, ovate-oval, obtuse, finely appressed-pubescent without; young achenia in a globose head about 6 mm. in diameter, sparingly pubescent, tipped with short, subulate styles.

*Distrib.* Idaho: Teton Range, 10,000 feet altitude, 1872 (Coulter); Needle Peak of Lost River Mts., 1890 (Vernon Bailey).

I am uncertain whether the *A. Baldensis*, of Hooker, belongs to this species or to *A. Drummondii*, S. Wats.

\* \* \* Achenia glabrous or merely strigose-pubescent, less numerous.

† Plants strictly 1-flowered.

‡ Involucral leaves sessile or nearly so.

○ Achenia with long, reflexed styles.

11. ***Anemone Richardsonii***, Hook.

*A. Richardsonii*, Hook., Fl. Bor. Am., i, 6 (1830).

*A. ranunculoides*, Richards., Frank. Journ., App. 12, not L.

*A. arctica*, Fisch., Linnæa, 1831, 574.

*A. Vahlîi*, Hornem., Fl. Dan., t. 2176.

Low, slender, pubescent, 5–30 cm. high, from slender rootstocks. Radical leaves reniform, slender-petioled, 3–5 parted, the lobes acute, broadly oblong, dentate or crenate; those of the involucre similar, sessile; flower single, about 20 mm. broad, white (?); sepals about 6, oblong; head of fruit depressed-spherical; achenia nearly glabrous, compressed, ovate-oblong, reflexed, tipped with a hooked persistent style of about their own length.

*Distrib.* Greenland, shore of Hudson's Bay, British Columbia, and in Arctic America generally to Alaska; also widely distributed in Siberia.

Type of *A. Richardsonii*, Hook., in Herb. Mus. Brit. and of *A. Vahlîi*, Hornem., in Herb. Mus. Paris.

o o Achenia with short styles.

12. ***Anemone deltoidea***, Dougl.

*A. deltoidea*, Dougl. in Hook. Fl. Bor.-Am., i, 6, t. 3, f. a (1830).

Sparingly hirsute-pubescent, simple, slender, erect, 15–30 cm. high. Root-stock filiform. Leaves 3-foliolate, the radical ones slender-petioled, those of the involucre nearly sessile; leaflets ovate, somewhat deltoid, obtuse or rounded at the base, acute at the apex, coarsely and irregularly crenate, sometimes incised, 2–5 cm. long; flower solitary, white, long-peduncled, 15–30 cm. broad; sepals 5–6, oval-obovate, obtuse; achenia several, densely pubescent, ovoid, somewhat flattened; style subulate, less than 1 mm. long; receptacle densely pubescent.

*Distrib.* Oregon (Scouler; Burke; Nuttall; Howell; E. Hall, 2; Nevius). Washington (Suksdorf); Columbia River (Douglas). California, Humboldt Co. (Rattan; a very large-flowered form with broader involucre leaves).

Type in Herb. Mus. Brit.

† † Involucral leaves slender-petioled.

o Eastern species.

13. ***Anemone quinquefolia***, L.

*A. quinquefolia*, L. Sp. Pl., 541 (1753).

*A. nemorosa*, Amer. Authors, not L.

*A. pedata*, Raf. Med. Rep. (ii) v, 361 (1808).

*A. minima*, D.C. Syst., i, 206 (1818).

*A. nemorosa* and var. *quinquefolia*, A. Gray, Man., Ed. 5, 38 (1867).

Low, simple, nearly glabrous, 10–20 cm. high, from thick, horizontal root-stocks. Radical leaves long-petioled, appearing later than the flowering stem, 3-foliolate, the lateral leaflets 2-parted nearly or quite to the base, the divisions oblong, cuneate, dentate; those of the involucre on slender petioles about 20 mm. long, 3–5 parted, the divisions 3–4 cm. long, acute, variously cut and lobed; flower 18–25 mm. broad; sepals 4–9, obovate or oval, white, or purplish without; head of fruit globose; achenia 4–10, pubescent, oblong, tipped with short, bent styles.

*Distrib.* Nova Scotia to Georgia, west to the Rocky Mountains; also in China (Herb. Kew).

Readily distinguishable from the European *A. nemorosa* by its slender habit, slender petioles, less lobed divisions of the involucre leaves, paler green of the foliage, and smaller flowers.

The species is based on “*Ranunculus nemorum*, fragariæ foliis,

Virginianus," Pluk., t. 106, f. 3, which is a satisfactory representation of our plant, and on a specimen from Kalm preserved in the Linnæan Herbarium.

#### 14. *Anemone trifolia*, L.

*A. trifolia*, L. Sp. Pl., 540 (1753).

*A. lancifolia*, Pursh, Fl. Amer. Sept., 386 (1814)

*A. nemorosa*, var., A. Gray, Amer. Nat., vii, 422.

Stout, erect, sparingly pubescent, 25–40 cm. high. Radical leaves long-petioled, ternate, the divisions ovate or ovate-lanceolate, acute, coarsely dentate, incised, or the lateral ones sometimes 2-parted, 6–10 cm. long, 4–6 cm. broad, thick; involucral leaves ternate, similar to the radical on stout petioles, 2–4 cm. long; flower white, 20–35 mm. broad; sepals oval, obtuse; head of fruit globose, about 1 cm. in diameter; achenia finely and densely pubescent, numerous, narrowly oblong, acuminate, tipped with short, slightly bent styles.

*Distrib.* Virginia: Salt Pond Mt. and Peaks of Otter: Pennsylvania; Layton's Station, Fayette Co. (S. W. Knipe, in Herb. Porter). Also in mountainous regions of continental Europe.

Type, a European specimen in Herb. Linn. I have little doubt that Pursh's *A. lancifolia* is this species, but I have not been able to find an authentic specimen of it. He says it occurs "on high mountains in boggy soil, Pennsylvania and Virginia." Schweinitz knew the plant and sent it to A. Brongniart under the name "*A. cuneifolia*."

o o Western species.

#### 15. *Anemone Grayii*, Behr.

*A. Grayii*, Behr. in Kellogg, Bull. Cal. Ac., i, 5 (1884).

*A. Oregana*, A. Gray, Proc. Amer. Acad., xxii, 308 (1887).

*A. cyanea*, Freyn, Deutsche Bot. Monats., viii, 176 (1890), not Risso, Fl. Nice, 2 (1844).

Stem erect, very slender, nearly glabrous, 20–50 cm. high. Radical leaves slender-petioled, 3-parted, the divisions crenate-serrate; leaves of the involucre on slender petioles 1–3 cm. long, 3-divided, finely appressed-pubescent, the divisions similar to those of the radical ones, but often 2–3-cleft; flower  $1\frac{1}{2}$ – $2\frac{1}{2}$  cm. broad; sepals commonly 5, ovate-oval, obtuse, glabrous, blue or purplish (rarely white?); achenia in a globose head, rather numerous, pubescent; styles short and slightly bent.

*Distrib.* Washington (Suksdorf). Idaho: Upper Clearwater (Watson, 6). Oregon: (Geyer, 606); Hood River (Mrs. Barrett; Henderson); Cascade Mts. (J. Howell); Waldo (T. Howell, 621);



Clear Water (Spaulding); Mt. Adams (Henderson); Siskiyou Mts. (L. W. Lee). California: (Kellogg and Harford, 4); Sierra Co. (Lemmon, 992); Upper Sacramento River and Mt. Tamalpais (Greene); Redwoods (Bolander); San Geronimo Ranch (Bigelow).

I am regarding the Californian and Oregon species as the same with some hesitation, but the specimens which I have seen do not afford me sufficient characters for their separation, and have followed Professor Greene (Pittonia, i, 48) in reducing *A. Oregona* to *A. Grayii*.

16. ***Anemone Lyallii*, n. sp.**

Slender, erect, nearly glabrous throughout, 10–40 cm. high, from a short horizontal rootstock. Radical leaves not seen; leaves of the involucre on very slender petioles 1.5–3 cm. long, 3-divided, the divisions sessile, ovate, or the terminal one sometimes nearly orbicular, dentate-crenate, or sometimes incised, acute, or obtuse, very thin, more or less ciliate along the margins; flowers solitary, white, about 1 cm. broad, its peduncle slightly exceeding the petioles of the involucral leaves; sepals about 5, oval-oblong, obtuse; young achenia quite densely strigose-pubescent.

*Distrib.* Sumass Woods, Lower Frazer River (Lyall); Washington (Suksdorf); Cascade Mts. (Howell); Victoria (Jas. Fletcher); Vancouver Island (Macoun); Wallamette Valley (Cusick); near Portland (Henderson); Salmon River, B. C. (Dawson).

Lyall's specimens preserved in Herb. Kew represent two quite different forms of leaves, but they evidently belong to the same species.

†† Plants tall, 2-several-flowered, the lateral peduncles involuclate.

‡ Involucels of the lateral peduncles distant from the main involucre.

o North American.

17. ***Anemone Canadensis*, L.**

*A. Canadensis*, L. Syst., Ed. 12, iii, App. 231 (1768).

*A. Pennsylvanica*, L. Mant., ii, 247 (1771).

*A. irregularis*, Lam. Encycl., i, 167 (1783), fide S. Watson.

*A. aconitifolia*, Michx., Fl. Bor. Am., i, 320 (1803).

*A. Laxmanni*, Steud. Nom., Ed. 2, i, 96.

30–60 cm. high, somewhat hairy, especially on the lower surfaces of the leaves, branching at the involucre. Radical leaves long-petioled, broader than long, 3–5 parted, the divisions broad, oblong, acute, variously cleft and toothed, those of both primary and secondary involucre similar, sessile; sepals white, oblong, obtuse; flower  $2\frac{1}{2}$ – $3\frac{1}{2}$  cm. broad; head of fruit globose; achenia flat, nearly orbicular, pubescent, or nearly glabrous at maturity, tipped with the stout, persistent style which is about their own length.

*Distrib.* Labrador and Anticosti to Maryland and Pennsylvania, west to Kansas and the Rocky Mountains, and to the Pacific coast of British America (Hooker).

Type of *A. Pennsylvanica*, L., in Herb. Linn.; type of *A. aconitifolia*, Michx. in Herb. Michaux.

At the place of first publication of this plant Linnæus says of its origin: "Hab. in Pennsylvania, D. Hope;" but when he republished it in the Mantissa three years later he says, "Hab. in Canada, H. U. (Hortus Upsaliensis);" curiously interchanging the locality and the specific name.

*A. dichotoma*, L. Sp. Pl., 540 (1753), of Siberia. (Type in Herb. Linn.), differs constantly in its narrower, oblong, leaf-segments which are toothed only towards the apex, and its glabrous achenia.

oo South American.

+ Leaves coriaceous; flowers 4-5 cm. broad. Chilian.

#### 18. *Anemone rigida*, C. Gay.

*A. rigida*, C. Gay, Fl. Chil., i, 25 (1845).

Erect, stout, rigid, loosely pubescent, 3-6 dm. high. Radical leaves long-petioled, coriaceous, deeply 3-parted, the divisions obovate, obtuse, incised, and coarsely dentate, the teeth mucronulate; leaves of the involucre sessile or narrowed at the base into short, broad petioles, 3-lobed to beyond the middle, incised and dentate similarly to the radical ones, appressed-pubescent with scattered hairs on both surfaces; involucre about 4-flowered, the first peduncle naked and slightly shorter than the others, which are involucrate with two sessile leaves at about the middle; flowers 4-5 cm. broad; sepals 4-6, broadly oval, obtuse, finely veined; filaments 3-5 mm. long; head of fruit globose-ovoid, about 1 cm. thick; achenia ovoid, acute, glabrous, except for a slight strigose pubescence at the base, tipped with a short, incurved style; receptacle densely pubescent, at length about twice as long as broad.

*Distrib.* Chili: (Gay); Talcareque (Reed); Cordillera de S. Fernando (Philippi).

Type in the Paris Herbarium.

+ + Leaves membranaceous.

□ Chilian and Peruvian species.

#### 19. *Anemone Antucensis*, Poepp.

*A. Antucensis*, Poepp., Fragm. Syn., 27 (1833).

Erect, slender, finely pubescent, 3-7.5 dm. high. Radical leaves slender petioled, membranaceous, deeply 3-5-parted or 3-5-cleft, the divisions obovate

or broadly oval, quite regularly incised and coarsely dentate, with obtuse, mucronulate teeth; involucre leaves sessile, otherwise similar to the radical ones; involucre 1-3-flowered, the first peduncle naked, the others involucellate with three or rarely two sessile leaves at about the middle; flowers white, about 2 cm. broad; sepals 4-6, oval, acutish or obtuse; filaments 3-4 mm. long; head of fruit globular; achenia about 15, lanceolate, glabrous, about 5 mm. long, very acute and tipped with a hooked style of about their own length; receptacle scurfy, not pubescent.

*Distrib.* Chili: Andes de Antuco (Poeppig, 150; Lechler, Pl. Chil., 3059).

Type in the Paris Herbarium.

## 20. *Anemone helleborifolia*, D.C.

*A. helleborifolia*, D.C., Syst. i, 211 (1818).

*A. æquinoctialis*, Poepp., Fragm. Syn., 27 (1833).

Erect, slender, tall, 40-80 cm. high, glabrous or nearly so. Radical leaves long-petioled, rather thick-membranaceous, glabrous, 3-parted, the divisions deeply lobed, cuneate, sometimes parted to the base, acute at the apex, sharply dentate-serrate, 8-12 cm. long; petioles 8-12 cm. long, pubescent or glabrate; leaves of the involucre short-petioled, similar to the radical but smaller, their petioles pubescent; flowers several or numerous, white,  $1\frac{1}{2}$ -2 cm. broad, the lateral peduncles involucellate near the summit, 1-4-flowered; sepals 5, oval, obtuse; achenia 10-20, oval, glabrous, or very nearly so; style short, hooked; receptacle pubescent.

*Distrib.* Peru: (Dombey, Poeppig, Pearce.)

Type of both *A. helleborifolia*, D. C., and *A. æquinoctialis*, Poepp., in the Paris Herbarium.

## 21. *Anemone Peruviana*, n. sp.

Erect, 3-9 dm. high. Radical leaves long-petioled, 5-7-divided, the segments obovate, cuneate at the base, deeply incised and dentate with mucronate-pointed teeth, a few scattered hairs on both surfaces; leaves of the involucre 2-5, short-petioled, mostly 3-divided, otherwise similar to the radical ones, but smaller, their petioles pilose-pubescent at the base; rays of the primary umbel 2-7, slender, 7-15 cm. long, the first one to appear naked and at length shorter than the others, which are involucellate and 2-4-flowered at the summit; flowers nearly an inch broad; sepals 4-7, lanceolate, acute or acuminate, veined; filaments broad; anthers oblong; achenia ovoid, glabrous, 2 mm. long, tipped with a slender, incurved style of about half their length; receptacle pubescent.

*Distrib.* Peru: Mathews, 537 (Hb. Kew); McLean (Hb. Kew).

□ □ Brazilian species.

22. *Anemone Sellowii*, Pritz.

*A. Sellowii*, Pritz., *Linnæa*, xv, 667 (1841).

"Foliis radicalibus ternatis, foliolis breviter petiolatis late ovatis supra argute-serratis, lateralibus profundissime bipartitis, intermedio trifido, involucralibus sessilibus minutis inciso-serratis, caule bifloro, sepalis subnovenis ovato-oblongis, carpidiis glabris, stylo tenui longo apice involuto."

"Habitat in Brasilia, Sellow, Coll. Pl. Bras., 891."

All I know of this plant is drawn from Pritzel's original description, and that of Eichler in Martius Flora Brasiliensis, xiii, part i, 153, t. 34, where the specimen contained in the Berlin Herbarium is beautifully figured. As suggested by Eichler, the species is allied to *A. Antucensis*, Poepp., but the engraving shows that it is clearly distinct.

23. *Anemone Glazioviana*, Urban.

*A. Glazioviana*, Urban., *Linnæa*, xliii, 255 (1880-1882).

"Petiolis 15-22 cm. longis, inferne parce, superne sicut lamina magis hirtulo-pilosis, foliis ternatim sectis, foliolis 0.7-3 cm. longe petiolulatis late rhombeis, lateralibus usque  $\frac{1}{2}$ - $\frac{2}{3}$  longitudinis 2-partitis, intermedio ad  $\frac{1}{3}$ - $\frac{1}{2}$  partem trifido, lobis obovato-rhombéis crenatis crenis apiculatis; pedunculo 1-2 floro, involucrio parvulo; sepalis circa 10 glabris 3 cm. longis oblongo-lanceolatis, ad basin unguiculario-angustatis; staminibus partem 4 tam sepalorum æquantibus, antheris connectivo paullulum producto apiculatis; carpidiis glabris, stylis mediocribus apice revolutis.

"Rhizoma breve validum fibras inferne ramosas emittens ad verticem gerit squamas paucas, folia 2-3 et pedunculum scapiformem.—Folia explanata ambitu  $\frac{2}{3}$  peripheriæ orbis præbentia circa 12 cm. lata 7-8 cm. longa membranacea, utrinque, subtus præsertim ad nervos, pilosa, marginibus ciliata; foliola subobconico-disposita.—Pedunculi pedales breviter pilosi; involucrum 1.5 cm. longum, 5 cm. a flore insertum, sessile trifoliolatum, foliolis liberis, intermedio ad  $\frac{2}{3}$  longitudinis trilobo, cæteris oblongis inciso-dentatis; pedunculus secundarius obvius, sed nondum evolutus; involucrellum 2 foliolatum basale cum involucro combinatum.—Flos sub antheri 6 cm. diametro; sepala exteriora 8-9 mm., interiora 6-7 mm. lata, nervis e basi prodeuntibus 5-7 superne ramosis.—Stamina 5-6 mm. longa.—Carpidia ultra 20, gynophori prominentiis innixa; ovaria ovato-oblonga in stylos iis æquilongos v. paullo longiores flexuosos tenues, apice stigmatoso circinnatim revolutos attenuata."

Prope Rio de Janeiro; Glaziou, n. 4744.

"Obs. *A. Sellowii*, Pritz., discrepat petiolis 5-10 cm. longis densius pubescentibus, foliolis 0.3-1 cm. longe petiolulatis multo angus-



tioribus, lateralibus ad  $\frac{3}{4}$  longitudinis v. plerumque fere usque ad basin 2-partitis, intermedio ad  $\frac{1}{2}$ – $\frac{2}{3}$  partem trifido, lobis obverse v. subrhombéo-lanceolatis, sepalis 1.2–1.5 cm. longis ad basin brevius et minus angustatis, staminibus dimidium floris æquantibus, antheris obtusissimis v. truncatis; *A. Antucensis*, Poepp. Frag. Syn. Plant. Chil. p. 27, Gay Chil. i, 25, quæ cum *A. Sellowii* magnitudine floris congruit, ab utraque longe recedit foliolis sessilibus, involucre amplo ad 6 cm. longo, involucello segregato, sepalis 6 (an semper?) dorso puberulis."

Not seen by me.

†† Lateral peduncles bracted at the base, close to the primary involucre.  
Mexican species.

#### 24. *Anemone Mexicana*, H. B. K.

*A. Mexicana*, H. B. K., Nov. Gen., v, 33 (1821).

Erect, villous-pubescent, 30–50 cm. high. Radical leaves slender-petioled, 3-parted, the divisions broadly oval, narrowed, or cuneate at the base, deeply incised and coarsely dentate with mucronate teeth; leaves of the involucre two, sessile or petioled, similar to the radical; involucre 1–4-flowered, the first peduncle naked, the others bracted at the base; flowers white, about  $2\frac{1}{2}$  cm. broad; sepals 4–6, oval or somewhat obovate, obtuse; head of fruit globose-ovoid; receptacle pubescent; filaments very slender, 2–3 mm. long; achenia ovoid, slightly pubescent, narrowed at the apex, tipped with a short style.

*Distrib.* Mexico: (Jurgensen, 240; Parkinson); Zinapan (Coulter, 654); Oaxaca (Galeotti, 4540); San Luis Potosi (Schaffner, 30); Santa Rosa (Dugés); Chiapas (Ghiesbrecht, 132).

Type in Herb. Humboldt, Bonpland and Kunth at Paris.

Said by Mr. Hemsley (Bot. Biol. Am. Centr., i, 5) to occur also in the United States, but I have seen no specimens from north of the Rio Grande.

#### 25. *Anemone Hemsleyi*, n. sp.

Erect, 25–60 cm. high, the petioles and peduncles densely pubescent. Radical leaves petioled, 3-parted into ovate slightly stalked, acuminate, sharply and irregularly serrate segments; leaves of the involucre 2, short-petioled, very broadly ovate, obtuse or truncate at the base, 3-cleft to beyond the middle, the divisions acute or acuminate, sharply serrate and sometimes slightly incised; involucre 3–6-flowered, the first peduncle naked, the others bracted at the base, as in *A. Mexicana*; flowers white (according to Linden), 3–4 cm. broad; sepals 5 in the specimens seen, broadly oval, obtuse; head of fruit oblong; receptacle densely pubescent; achenia oblong, glabrous, 5 mm. long, tipped with a short style.

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*Distrib.* Mexico: near Vera Cruz (Linden, 964); Orizaba (Botteri, 21).

Type in the Kew Herbarium.

‡ ‡ ‡ Plants umbellately 1-several-flowered, the peduncles all naked and flowering simultaneously.

o Species of arctic and mountainous regions of the northern hemisphere.

## 26. *Anemone narcissiflora*, L.

*A. narcissiflora*, L. Sp. Pl., 542 (1753).

*A. fasciculata*, L. Sp. Pl., 542 (1753).

Villous-pubescent, but sometimes sparingly so, erect, usually rather stout, 15–45 cm. high. Radical leaves petioled, palmately 3–5-parted, the divisions obovate, cuneate, deeply incised into linear-oblong, obtuse, or acute lobes; leaves of the involucre sessile, smaller, usually less divided, otherwise similar; flowers 1–6, umbellate, peduncled, white, all maturing together, 1.5–3 cm. broad; sepals 5–7, oval-obovate, obtuse; carpels several, flat, oval, glabrous, tipped with a short, curved style.

*Distrib.* Rocky Mts. (Hall and Harbour, 7). Colorado: (Sheldon); Long's Peak (Vasey, 7); South Park (Wolf and Rothrock, 102). Alaska (Bongard; Mertens; Menzies; Barclay; Fischer; Dall; Stejneger; Townsend; Harrington; Kellogg, 305; Muir, J. M. Macoun). Reported from Newfoundland by Reeks. Also in Europe and Asia.

Type in the Linnæan Herbarium.

oo Species of the Andes of Ecuador.

## 27. *Anemone Jamesoni*, Hook.

*A. Jamesoni*, Hook., Ic. Pl., t. 670 (1844).

Rootstock horizontal. Stem erect or ascending, 15–25 cm. high, hirsute; radical leaves long-petioled, ternate, hirsute, the divisions stalked, ternate, and the segments deeply divided into oblong, cuneate, obtuse, mostly dentate lobes; peduncles 1–3, slender, not involucrellate; flowers about 2 cm. broad; sepals 5, oval, obtuse, pilose-pubescent without; head of fruit globose, dense, about 1 cm. in diameter; carpels ovate, glabrous, tipped with short, subulate, hooked styles.

*Distrib.* Andes of Ecuador, 12,000 feet (Jameson, 86).

Type in the Kew Herbarium.

ooo Chilian species.

28. ***Anemone hepaticifolia*, Hook.**

*A. hepaticifolia*, Hook., Ic. Pl., t. 1 (1837).

Roots fibrous. Stem erect, rather stout, hirsute with spreading hairs, 30–65 cm. high; radical leaves petioled, 5–10 cm. long, hastate, 3-lobed, thick, hirsute, especially beneath, the lobes acutish, angular-dentate; petioles hirsute, about equalling the leaves; leaves of the involucre sessile, lanceolate, deeply lobed, 3–6 cm. long; flowers umbellate, 2–4 cm. broad, yellow; sepals 5, spreading, elliptic-obovate; achenia ellipsoid, gelatinous, tipped with a short, recurved style.

*Distrib.* Chili: (Gay; Philippi, 277; Cuming; Lechler, 556); Bay of Valdivia (Bridges, 579); Cerros de Corral, 1000 feet (Pearce).

Type in the Kew Herbarium.

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EXCLUDED OR DUBIOUS SPECIES.

*Anemone nudicaulis*, A. Gray, Bot. Gaz., xi, 17 (1886), from Lake Superior, is *Ranunculus Lapponicus*, L., according to the original specimens in Herb. Gray. It was described from fruiting specimens only.

*Anemone anomala*, Raf. Fl. Lud., 82 (1817). “Foliis ternis, sessilibus, incis, floribus pentapetalis, petalis inequalibus,” based on *Anemone*, No. 2, Robin, Voy. Louisiane, iii, 463, is wholly unknown. As the flowers are said by Robin to be irregular it probably belongs to some different genus.

3. **HEPATICA**, L. Gen. Pl., 162 (1737).

1. ***Hepatica Hepatica* (L.).**

*Anemone Hepatica*, L. Sp. Pl., 538 (1753).

*Hepatica triloba*, Chaix in Vill. Hist. Pl. Dauph., i, 336 (1786).

*H. triloba*, var. *Americana*, D.C. Syst., i, 216 (1818).

*H. Americana*, Ker, Bot. Reg., t. 387 (1819).

*A. Americana*, ex Nichols., Dict. Gard., i, 74.

Acaulescent, 10–15 cm. high, villous, roots fibrous. Radical leaves long-petioled, reniform, 5–6 cm. broad when mature, spreading and declined on the ground, three-lobed, and the lobes sometimes toothed or again lobed, obtuse; involucre calyx-like, of three sessile, obtuse, oblong leaves immediately under the flower; flowers purple or white, 12–25 mm. broad, on peduncles about equal-

ling the petioles; sepals oblong, obtuse, longer than the stamens; achenia several, 4 mm. long, oblong, acute, hairy.

*Distrib.* In woods, Nova Scotia to northern Florida, west to Iowa and Missouri.

The American plant does not appear from herbarium specimens to be different from the European, but I have not seen them growing together.

Type, a European specimen in the Linnæan Herbarium.

## 2. *Hepatica acuta* (Pursh).

*Hepatica triloba*, var. *acuta*, Pursh, Fl. Am. Sept., 391 (1814).

*Hepatica acutiloba*, D.C., Prodr., i, 22 (1824).

*Anemone acutiloba*, Lawson, Trans. Nov. Sco. Inst., iii, 30 (1870).

*A. acuta*, Vail, Mem. Torr. Club, ii, 42 (1890).

*A. Hepatica*, var. *acuta*, Hitch., Trans. St. Louis Acad. Sci., v, 482 (1891).

Acaulescent, 10–22 cm. high, villous, and closely resembling the last, differing in the lobes of the leaves and of the involucre which are acute or acutish, these characters being, however, constant.

*Distrib.* In woods, Quebec and throughout Ontario, south in the Alleghanies to Georgia, but rare or absent near the Atlantic coast, west to Iowa and Minnesota.

I have not seen Pursh's type. The type of *Hepatica acutiloba*, D.C., is preserved at Geneva.

The distribution of this and the preceding species has been capitally worked out by Mr. C. G. Lloyd (Drugs and Medicines, N. A., i, 40, Plate VI).

## 4. *CAPETHIA*, Britton.

### 1. *Capethia integrifolia* (D.C.).

*Hepatica integrifolia*, D.C. Syst., i, 217 (1818).

*Anemone integrifolia*, H. B. K., ex D.C., loc. cit., et Wedd. Chlor. And., ii, 298, t. 83, f. A, 1, 2, 3, 4.

*Hamadryas andicola*, Hook., Ic. Pl., t. 137 (1837).

Perennial by a deep, thick, woody root, acaulescent, densely pilose-pubescent. Leaves all radical, numerous, petioled, rhombic ovate, or spatulate, entire, obtuse or acutish, 4–9 cm. long, 1–1½ cm. wide; scape naked, shorter than the leaves; flower 3–4 cm. broad, violet or white; sepals 10–15, lanceolate or linear-lanceolate, loosely pubescent; young carpels very densely pubescent; style slender, curved at the apex.

*Distrib.* High Andes of Peru, Bolivia, and Ecuador. Peru: (Ruiz and Pavon; Gay, 535; Lechler, 2706; Matthews, 1139;



McLean). Bolivia: (Mandon, 869). Ecuador: Andes of Quito (Jameson).

Type in Herb. Humboldt, Bonpland and Kunth at the Paris Museum.

"Cinerarea del Peru," specimen from Pavon in Herb. Mus. Brit.

"Cinerarea del Cordillera," specimen in Herb. Boiss.

2. **Capethia Weddellii**, n. sp.

Leaves ovate, abruptly contracted into the petiole; scape nearly as long as the leaves, bracted at about the middle; flower smaller; head of fruit globose, about 8 mm. in diameter; achenia obliquely ovoid, pubescent; style slender, straight, deflected, inserted below the apex.

This plant is figured by Weddell (Chlor. And., ii, t. 83, f. A, 5, 6, 7) as "*Anemone integrifolia*,  $\beta$ . petiolis scapisque magis elongatis, floribus parvis." I think it must be specifically distinct, but, although I examined the *Anemones* of the Paris Herbarium I took no note of it, and Weddell does not say where it was collected. It is probably Peruvian.

5. **BARNEOUDIA**, C. Gay. Fl. Chil., i, 29 (1845).

1. **Barneoudia Chilensis**, C. Gay.

*Barneoudia Chilensis*, C. Gay, Fl. Chil., i, 29, t. 1 (1845).

Glabrous or nearly so, 6-12 cm. high. Scape 1-flowered; involucre approximate to the flower, deeply divided into 5-7, obtuse, entire, lobed or bifid segments; sepals about 8, obovate; ovaries densely villous-pubescent; style filiform, curved.

*Distrib.* Chili.

Type in the Paris Herbarium.

2. **Barneoudia major**, Phil.

*Barneoudia major*, Phil., Linnæa, xxviii, 609 (1856).

Larger than the preceding species, villous-pubescent above. Involucre pubescent on the upper surface, 5-6-lobed, the lobes 3-5-cleft; sepals about 12, linear-lanceolate, obtuse.

*Distrib.* Chili.

Type in the Paris Herbarium.

### 3. *Barneoudia Domeykoana*, Leybold.

*Barneoudia Domeykoana*, Leybold, Ann. Univ., 1858, 159, et Flora, xlii, 242 (1859).

“Rhizomate tuberculoso; scape glabro; foliis longe petiolatis, glabris, tripartitis lobis obtusato spathulatis, integris vel obtuse 1-3-dentatis; involuero 5-6 lobato, flore densissime approximato, externe glaberrimo, interne basin versus sericeo-tomentoso; lobulis lanceolato-obovatis obtusis integerrimis vel subrepandis; sepalis petaloidis, lineari-obovatis, obtusis; filamentis linearibus; capsulis plurimus cylindricis, e basi longe-sericeis, apice stylo persistente filiformi arcuato coronatis.”

*Distrib.* Chili. In grassy places on the higher Cordillera, blooming at the melting of snow in the latter part of November. Discovered on the Cerro Colorado, in the valley of Mapocho, at an altitude of about 10,000 feet.

Not seen by me.

### 4. *Barneoudia Balliana*, n. sp.

15-20 cm. high, fleshy, the involueral leaf 3-7-lobed, very thick, 6-7 cm. wide, the lobes rounded or obtuse, obovate, densely and finely appressed-pubescent on the upper surface. “*B. major*, Phil., differs in having the fruit covered with silky hairs.”

The specimen on which this species is based is in the Kew Herbarium, derived from the herbarium of the late John Ball. No flowers nor fruit remain upon it, but from the note by Mr. Ball, above quoted, he appears to have seen the fruit. The plant has a decidedly different aspect from *B. major*. It is labelled *Anemone crassifolia*, Hieron., but I cannot find that it has been published. At all events there is already an *Anemone crassifolia*, Hook., from Tasmania (Ic. Pl., t. 257).

*Distrib.* Argentine Republic: Sierra Famentina, Prov. de la Rioja (Hieronymus).

6. **SYNDESMON**, Hoffmg., Flora, xv, Part II. Intell. Bl. No. 4, 34 (1832).

1. **Syndesmon thalictroides** (L.).

*Anemone thalictroides*, L. Sp. Pl., 542 (1753).

*Thalictrum anemonoides*, Michx., Fl. Bor.-Am., i, 332 (1803).

*Syndesmon thalictroides*, Hoffmansg., Flora, xv, Part II. Intell. Bl., No. iv, 34, 1832.

*Thalictrum Carolinianum*, Walt., Fl. Car., 137 (1788)?

*Anemone thalictroides*, var. *uniflora*, Pursh, Fl. Am. Sept., 387 (1814).

*Anemone Walteri*, Pursh, Fl. Am. Sept., 387 (1814)?

*Anemonella thalictroides*, Spach, Hist. Veg., vii, 240 (1839).

Low, glabrous, 10–25 cm. high, the flowering stem arising in early spring from a cluster of fleshy tubers, the ternately-compound radical leaves appearing later, and resembling those of *Thalictrum*; leaves of the involucre similar, sessile, the leaflets long-petioled; sepals 5–10, white, longer than the stamens, forming a flower 12–25 mm. broad; flowers perfect, umbellate, immediately above the involucre; stigmas depressed truncate, sessile; achenia terete, sessile, pointed, 8–12 mm. long, ribbed and grooved.

*Distrib.* In woods throughout the eastern United States, south to Florida, west to Kansas, Minnesota, and Mississippi, sparingly in Ontario. Not reported from the maritime provinces of Canada.

In suggesting the generic name *Syndesmon*, it is said by Reichenbach, the writer of the note in Flora: "Diese Gattung hat Hoffmg. gebildet um sowohl *Anemone* wie *Thalictrum* formen zu reinigen die nicht in selbigen aber sehr wohl zusammen passen."

Pursh's *Anemone Walteri* is based entirely on Walter's *Thalictrum Carolinianum*, which he never saw, and no specimen of it is contained in Walter's Herbarium. From the descriptions it may be this species.

Alluding to Plukenet's figure (t. 106, f. 4), Jussieu says (Ann. Mus. Hist. Nat., iii, 250 (1804): "Cette plante désignée par lui sous nom de *Ranunculus*, par Gronovius sous celui de *Thalictrum*, réunie ensuite à l'*Anemone* par Linnæus conservée dans ce genre par tous les autres botanistes, a été de nouveau reportée au *Thalictrum* par Michaux, sous les nom de *T. anemonoides*, fl. Amer., i, p. 322. Il aura pu être déterminé à ce changement par les involucre conformés différemment, et sur-tout par les graines allongées et striées comme celles du *Thalictrum*; mais si d'après les rapports naturels on refuse un involucre au *Thalictrum* et si on l'assigne comme caractère principal de l'*Anemone*; si de plus on suit strictement l'indication de Linnæus que conserve dans ce dernier genre la

plante qui a plus de cinq pétales, alors on sera doublement forcé de n'en point séparer celle qui fait l'objet de cette discussion et qui servira seulement à établir une transition de l'un à l'autre genre."

Sims gives a very good figure of it in Bot. Mag., t. 866 (1805), and remarks: "A dubious species, but certainly agreeing in more points with *Anemone* than with *Thalictrum*."

Type of *Anemone thalictroides*, L., in Herb. Linn.; type of *Thalictrum anemonoides*, Michx., in Herb. Michaux.



#### IV.—*The Rutherford Photographic Measures of the Group of the Pleiades.*

BY HAROLD JACOBY.

Read Dec. 7, 1891.

### I.

#### INTRODUCTION.

THE present paper contains the results of RUTHERFURD'S photographic observations of the Pleiades group, made in 1872 and 1874. The history of the plates, together with a description of the apparatus with which they were made and measured, will form the subject of a separate paper by Professor J. K. Rees, at whose suggestion, it is proper to say, the entire investigation was undertaken by me. The Pleiades have been selected for reduction from among a large number of clusters photographed by RUTHERFURD with his 13 inch telescope, because this group offers the best opportunity for judging of the accuracy obtainable by the methods employed. It is hoped that the near future will see the publication of all the other RUTHERFURD measures, many of which constitute the earliest accurate observations of the clusters in question. The measures, as contained in the observation books, are in the form of position angles and distances from the star 24 *p*. This star was selected as the origin of coördinates, for it is situated near the centre of the cluster, and is otherwise better suited to measurement than the neighboring large star *Alcyone*. Accordingly, the method of reduction in its general course is similar to that in use for ordinary micrometric measures, and to that adopted by GOULD in his reduction of the earlier Pleiades observations.\* The author takes this opportunity to thank Dr. Gould for his kindness in explaining many of the details of the methods used by him. It has been possible to obtain a very accurate determination of the scale values for the various plates by a comparison with BESSEL'S measures, and the recent ones of ELKIN.† These scale values will be of very high

\* National Academy of Sciences, vol. iv, third memoir.

† Transactions of the Astronomical Observatory of Yale University, vol. i, part i.

importance when the reduction of the other clusters is undertaken. The details in regard to them will be found under V. in the present paper. In general, an effort has been made to let the reduction of each plate be separate from that of the others as far as possible. General correction tables have in most cases been replaced by special tables for each plate. Thus the numbers obtained control each other, and the results from each plate become available before all the plates are finished.

In making the exposures, two impressions of the cluster were taken on each plate. The second impression is West of the first. After it was finished, the clock-work of the telescope was stopped, and the cluster allowed to move off the plate, the brighter stars leaving "trails," or black lines on the developed negative. Shortly before the central star reached the edge of the plate, the clock was again started, and the central star was allowed to impress itself once more. This final image of the central star gives us the *orientation* of the plate, as after the application of the proper corrections, it furnishes the direction of position angle  $270^\circ$ . (See VI.) Both the Eastern and Western impressions were always measured. In the reductions these sets of measures have been treated as if they came from separate plates, a proceeding which helps to eliminate errors of computation. Each complete measure of position angle comprises three settings on the last image of the central star, and three on the star to be measured, in both positions of the measuring micrometer; or twelve settings in all. The measures of distance consist of similar means of twenty settings. There are in all 1262 complete measures of distance, and as many of position angle. The following table gives various quantities connected with the several plates. The first column contains the number of the plate, those originally marked on the plates after development being retained. The second column contains the date; the third the middle sidereal time of the exposure. The column headed *Tel. Therm.* gives the reading of a thermometer attached to the tube of the telescope. The column *focus* gives the reading of a micrometer head, which measured the position of the plate-holder. In the column marked *zero* is given the distance of the last (or orientation) impression of the central star from the origin of co-ordinates. These distances are expressed in divisions of the glass scale of the measuring micrometer. The last columns give the zenith distance ( $\zeta$ ), the parallactic angle ( $q$ ), and the refraction constant ( $\pi$ ), for the central star 24 p.

## OBSERVATORY OF L. M. RUTHERFORD, NEW YORK.

Lat. =  $40^{\circ} 43' 48''$ . 5, Long. =  $4^{\text{h}} 55^{\text{m}} 56^{\text{s}}$ . 62 W.

No.	Date.	Sidereal Time.	Bar.	Atm. Therm.	Ext. Therm.	Tel. Therm.	Focus.	Zero.	$\xi$	$q$	Log. $\kappa$ .
16 E.	1872 Jan. 9	5 <sup>h</sup> 41 <sup>m</sup> 10 <sup>s</sup>	in.	34°	32°	35°	7.9	89.79	30.54	+48.88	6.4672
16 W.	1872 Jan. 9	5 47 20	30.12						31.02	+49.79	6.4671
17 E.	1872 Jan. 9	6 16 0	30.12	34	32	35	7.9	89.78	36.76	+52.94	6.4668
17 W.	1872 Jan. 9	6 22 0							37.87	+53.44	6.4667
18 E.	1872 Jan. 26	4 14 15	29.72	27	24	27	8.1	73.24	18.48	+21.01	6.4692
18 W.	1872 Jan. 26	4 20 25							19.02	+24.23	6.4692
19 E.	1874 Nov. 7	23 46 55	30.47	52	49	52	7.78	57.54	51.10	-55.87	6.4547
19 W.	1874 Nov. 7	23 53 0							49.96	-55.83	6.4550
20 E.	1874 Nov. 7	0 23 0	30.47	52	49	52	7.78	73.36	44.30	-55.24	6.4560
20 W.	1874 Nov. 7	0 29 5							43.15	-55.02	6.4562
21 E.	1874 Nov. 7	0 55 15	30.47	52	49	52	7.85	81.51	38.29	-53.60	6.4566
21 W.	1874 Nov. 7	1 1 20							37.16	-53.13	6.4566
22 E.	1874 Nov. 12	1 21 35	30.27	38	35	40	7.85	73.49	33.50	-51.16	6.4664
22 W.	1874 Nov. 12	1 27 40							32.43	-50.41	6.4665
23 E.	1874 Nov. 12	1 53 0	30.27	38	35	40	7.85	73.46	28.08	-46.35	6.4666
23 W.	1874 Nov. 12	1 59 5							27.09	-45.10	6.4667
24 E.	1874 Nov. 26	23 42 45	30.39	36	35	35	7.85	73.44	51.89	-55.87	6.4661
24 W.	1874 Nov. 26	23 48 50							50.74	-55.86	6.4663
25 E.	1874 Nov. 26	0 36 25	30.39	36	35	35	7.85	89.68	41.77	-54.70	6.4677
25 W.	1874 Nov. 26	0 42 30							40.64	-54.39	6.4678

## II.

## DIVISION ERRORS.

THE glass scale of the micrometric measuring machine is about seven inches long, and has 335 spaces. All the measures of distance were made with this scale. It was read by means of a reading microscope of the customary form, so arranged that ten revolutions of the screw corresponded to one space on the scale. Thus it was possible to read directly to .001 spaces, and by estimation to .0001. All readings were made in this way to .0001 spaces. Before the reduction of the observations was begun the scale was sent to Professor W. A. Rogers, of Colby University, Waterville, Me. The latter has investigated the division errors. The method employed was not such as would free the results from cumulative error; but it is highly probable that a sufficient degree of accuracy for the present purpose has been attained. Professor Rogers has measured the 50-spaces, the 25-spaces, the 5-spaces, and finally the single spaces, with his micrometric apparatus; and the results are given in terms of 1 division of his micrometer microscope. This equals 0.0000002 meters. The measures of the 50-spaces have not been used, as they were only made as a check upon the measurement of the 25-spaces. The following are the results:—



RELATIVE ERRORS OF THE 50-SPACES.

Space.	Error of Space.	Total Error.
	div.	div.
0- 50	+ 5.5	+ 5.5
50-100	- 0.7	+ 4.8
100-150	+54.8	+59.6
150-200	+ 9.6	+69.2
200-250	-23.4	+45.8
250-300	-45.8	+ 0.0

RELATIVE ERRORS OF THE 25-SPACES.

Space.	Error of Space.	Total Error.
	div.	div.
0- 25	+ 8.4	+ 8.4
25- 50	- 4.3	+ 4.1
50- 75	+ 7.6	+11.7
75-100	- 7.4	+ 4.3
100-125	+25.7	+30.0
125-150	+31.2	+61.2
150-175	+ 6.6	+67.8
175-200	+ 4.3	+72.1
200-225	+ 3.7	+75.8
225-250	-32.1	+43.7
250-275	-29.8	+13.9
275-300	-19.8	- 5.9
300-325	+ 5.9	0.0

## RELATIVE ERRORS OF THE 5-SPACES.

Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
	div.	div.		div.	div.		div.	div.
0-5	-2.6	-2.6	25-30	-4.2	-4.2	50-55	-3.2	-3.2
5-10	+1.4	-1.2	30-35	+1.3	-2.9	55-60	+8.7	+5.8
10-15	-4.0	-5.2	35-40	-3.9	-6.8	60-65	+0.4	+5.9
15-20	+14.2	+9.0	40-45	+2.3	-4.5	65-70	-1.1	+4.8
20-25	-9.5	0.0	45-50	+4.5	0.0	70-75	-4.8	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
	div.	div.		div.	div.		div.	div.
75-80	-2.1	-2.1	100-105	-1.8	-1.8	125-130	-3.2	-3.2
80-85	-0.3	-2.4	105-110	+0.4	-1.4	130-135	-3.0	-6.2
85-90	+2.9	+0.5	110-115	+1.3	-0.1	135-140	+0.7	-5.5
90-95	+2.0	+2.5	115-120	-4.6	-4.7	140-145	+5.8	+0.6
95-100	-2.5	0.0	120-125	+4.7	0.0	145-150	-0.6	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
	div.	div.		div.	div.		div.	div.
150-155	+4.0	+4.0	175-180	-1.5	-1.5	200-205	-5.6	-5.6
155-160	-1.4	+2.6	180-185	+0.5	-1.0	205-210	-3.6	-9.2
160-165	+0.8	+3.4	185-190	-2.3	-3.3	210-215	-3.4	+2.6
165-170	-1.3	+2.1	190-195	+1.8	-1.5	215-220	+9.5	+3.1
170-175	-2.1	0.0	195-200	+1.5	0.0	220-225	+3.1	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
	div.	div.		div.	div.		div.	div.
225-230	+2.9	+2.9	250-255	-0.3	-0.3	275-280	+2.5	+2.5
230-235	+4.1	+7.0	255-260	+2.1	+1.8	280-285	-4.4	-1.9
235-240	-0.7	+6.3	260-265	-0.3	+1.5	285-290	-3.4	-5.3
240-245	+1.7	+8.0	265-270	+0.2	+1.7	290-295	+1.5	-3.8
245-250	-8.0	0.0	270-275	-1.7	0.0	295-300	+3.8	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
				div.	div.			
			300-305	+1.9	+1.9			
			305-310	+3.3	+5.2			
			310-315	-1.2	+4.0			
			315-320	-1.9	+2.1			
			320-325	-2.1	0.0			

## RELATIVE ERRORS OF THE SINGLE SPACES.

Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
0-1	div.	div.	5-6	div.	div.	10-11	div.	div.
1-2	-5.6	-5.6	6-7	-2.2	-2.2	11-12	+5.7	+5.7
2-3	+3.1	-2.9	7-8	+3.6	+1.4	12-13	-1.7	+4.4
3-4	-0.1	-3.5	8-9	-0.4	+1.0	13-14	-0.5	+3.9
4-5	+5.5	+2.0	9-10	-4.2	-3.2	14-15	-3.7	-0.2
	-2.0	0.0		+3.2	0.0		+0.2	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
15-16	div.	div.	20-21	div.	div.	25-26	div.	div.
16-17	+3.4	+3.4	21-22	+4.0	-4.0	26-27	-4.7	-4.7
17-18	-0.5	+2.9	22-23	+2.5	-1.5	27-28	+3.2	-1.5
18-19	-3.1	-0.2	23-24	-0.4	-1.9	28-29	+1.2	-0.3
19-20	+1.5	+1.3	24-25	+0.5	-1.4	29-30	+0.9	+0.6
	-1.5	0.0		+1.4	0.0		-0.6	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
30-31	div.	div.	35-36	div.	div.	40-41	div.	div.
31-32	+0.8	+0.8	36-37	-1.0	-1.0	41-42	+1.0	+1.0
32-33	+2.8	+3.6	37-38	+3.3	+2.3	42-43	-1.0	0.0
33-34	-3.4	+0.2	38-39	-1.7	+0.6	43-44	-1.1	-1.1
34-35	-0.7	-0.5	39-40	-4.7	+4.1	44-45	+0.8	-0.3
	+0.5	0.0		+4.2	0.0		+0.2	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
45-46	div.	div.	50-51	div.	div.	55-56	div.	div.
46-47	-0.9	-0.9	51-52	+3.8	+3.8	56-57	+0.8	+0.8
47-48	+0.7	-0.2	52-53	-1.2	+2.6	57-58	+1.9	+2.7
48-49	-0.7	-0.9	53-54	-0.6	+2.0	58-59	-2.0	+0.7
49-50	-1.0	-1.9	54-55	+2.0	+4.0	59-60	+0.7	+1.4
	+2.1	0.0		-3.9	0.0		-1.5	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
60-61	div.	div.	65-66	div.	div.	70-71	div.	div.
61-62	-0.6	-0.6	66-67	+0.7	+0.7	71-72	+2.0	+2.0
62-63	+0.4	-0.2	67-68	-0.9	-0.2	72-73	-2.4	-0.4
63-64	-1.2	-1.4	68-69	+1.3	+1.1	73-74	-2.4	-2.8
64-65	+0.7	-0.7	69-70	-1.5	-0.4	74-75	+3.6	+0.8
	+0.6	0.0		+0.5	0.0		-1.0	0.0

RELATIVE ERRORS OF THE SINGLE SPACES.—*Continued.*

Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
	div.	div.		div.	div.		div.	div.
75-76	+1.2	+1.2	80-81	-1.1	-1.1	85-86	+6.0	+6.0
76-77	-0.5	+0.7	81-82	+1.2	+0.1	86-87	-0.8	+5.2
77-78	-1.1	-0.4	82-83	0.0	+0.1	87-88	-6.3	-1.1
78-79	-0.4	-0.8	83-84	-0.4	-0.3	88-89	+0.5	-0.6
79-80	+0.9	0.0	84-85	0.0	0.0	89-90	+0.6	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
	div.	div.		div.	div.		div.	div.
90-91	-2.4	-2.4	95-96	-1.4	-1.4	100-101	-0.8	-0.8
91-92	-2.4	-4.8	96-97	0.0	-1.4	101-102	+1.9	+1.1
92-93	+0.4	-4.4	97-98	+0.1	-1.3	102-103	0.0	+1.1
93-94	+2.8	-1.6	98-99	-0.1	-1.4	103-104	-1.0	+0.1
94-95	+1.5	0.0	99-100	+1.5	0.0	104-105	+0.1	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
	div.	div.		div.	div.		div.	div.
105-106	-0.5	-0.5	110-111	-3.3	-3.3	115-116	-3.5	-3.5
106-107	-0.1	-0.6	111-112	-2.0	-1.3	116-117	-0.6	-4.1
107-108	-0.8	-1.4	112-113	-0.7	-6.0	117-118	+1.5	-2.6
108-109	+0.6	-0.8	113-114	+2.7	-3.3	118-119	+0.6	-2.0
109-110	+0.7	0.0	114-115	+3.2	0.0	119-120	+1.9	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
	div.	div.		div.	div.		div.	div.
120-121	+0.3	+0.3	125-126	-0.8	-0.8	130-131	+0.4	+0.4
121-122	-0.8	-0.5	126-127	+3.5	+2.7	131-132	-3.0	-2.6
122-123	-0.2	-0.7	127-128	-1.9	+0.8	132-133	-0.3	-2.9
123-124	+1.7	+1.0	128-129	-2.4	-1.6	133-134	+2.4	-0.5
124-125	+1.0	0.0	129-130	+1.6	0.0	134-135	+0.4	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
	div.	div.		div.	div.		div.	div.
135-136	-0.9	-0.9	140-141	+4.2	+4.2	145-146	+1.6	+1.6
136-137	-1.4	-2.3	141-142	-4.3	-0.1	146-147	+0.4	+2.0
137-138	-1.3	-3.6	142-143	+2.2	+2.1	147-148	+1.1	+3.1
138-139	+0.6	-3.0	143-144	-1.7	+0.4	148-149	+0.3	+3.4
139-140	+3.0	0.0	144-145	-0.4	0.0	149-150	-3.4	0.0



RELATIVE ERRORS OF THE SINGLE SPACES.—*Continued.*

Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
150-151	div. —0.2	div. —0.2	155-156	div. +1.4	div. +1.4	160-161	div. —0.3	div. —0.3
151-152	+0.8	+0.6	156-157	—0.7	+0.7	161-162	+2.9	+2.6
152-153	+0.5	+1.1	157-158	—3.2	—2.5	162-163	—0.9	+1.7
153-154	—128.8	—127.7	158-159	+3.6	+1.1	163-164	—3.8	—2.1
154-155	+127.7	0.0	159-160	—1.1	0.0	164-165	+2.2	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
165-166	div. —0.1	div. —0.1	170-171	div. +2.0	div. +2.0	175-176	div. +0.8	div. +0.8
166-167	+0.1	0.0	171-172	+0.6	+2.6	176-177	—1.6	—0.8
167-168	+1.8	+1.8	172-173	—0.9	+1.7	177-178	+5.7	+4.9
168-169	—1.9	—0.1	173-174	—1.7	0.0	178-179	—2.0	+2.9
169-170	0.0	0.0	174-175	0.0	0.0	179-180	—2.8	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
180-181	div. +2.8	div. +2.8	185-186	div. +1.0	div. +1.0	190-191	div. —1.3	div. —1.3
181-182	—2.1	+0.7	186-187	+3.0	+4.0	191-192	+1.0	—0.3
182-183	—1.6	—0.9	187-188	—0.9	+3.1	192-193	+1.8	+1.5
183-184	+0.3	—0.6	188-189	—2.2	+0.9	193-194	+0.7	+2.2
184-185	+0.6	0.0	189-190	—0.8	0.0	194-195	—2.3	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
195-196	div. +0.6	div. +0.6	200-201	div. —1.9	div. —1.9	205-206	div. +3.6	div. +3.6
196-197	—1.8	—1.2	201-202	—0.8	—2.7	206-207	+2.7	+6.3
197-198	—0.3	—1.5	202-203	—0.7	—3.4	207-208	—2.0	+4.3
198-199	—0.4	—1.9	203-204	+0.6	—2.8	208-209	—5.4	—1.1
199-200	+1.7	0.0	204-205	+2.6	0.0	209-210	+1.3	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
210-211	div. —1.1	div. —1.1	215-216	div. —0.2	div. —0.2	220-221	div. +0.1	div. +0.1
211-212	—2.1	—3.2	216-217	+1.5	+1.3	221-222	+0.8	+0.9
212-213	—0.6	—3.8	217-218	—2.5	—1.2	222-223	—0.8	+0.1
213-214	+2.7	+1.1	218-219	—0.6	—1.8	223-224	—1.0	—0.9
214-215	+0.8	0.0	219-220	+1.9	0.0	224-225	+1.1	0.0

RELATIVE ERRORS OF THE SINGLE SPACES.—*Continued.*

Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
	div.	div.		div.	div.		div.	div.
225-226	+1.5	+1.5	230-231	+2.1	+2.1	235-236	-3.8	-3.8
226-227	-0.4	+1.1	231-232	-2.0	+0.1	236-237	+0.9	-2.9
227-228	+1.1	+2.2	232-233	-0.6	-0.5	237-238	0.0	-2.9
228-229	-1.2	+1.0	233-234	+0.4	-0.1	238-239	-0.8	-3.7
229-230	-1.0	0.0	234-235	+0.1	0.0	239-240	+3.7	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
	div.	div.		div.	div.		div.	div.
240-241	+3.3	+3.3	245-246	+3.1	+3.1	250-251	-0.7	-0.7
241-242	-0.2	+3.1	246-247	+2.5	+5.6	251-252	-3.0	-3.7
242-243	+0.6	+3.7	247-248	-2.5	+3.1	252-253	+1.3	-2.4
243-244	-1.2	+2.5	248-249	+1.3	+4.4	253-254	-0.4	-2.8
244-245	-2.8	0.0	249-250	-4.2	0.0	254-255	+2.9	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
	div.	div.		div.	div.		div.	div.
255-256	+2.0	+2.0	260-261	-0.6	-0.6	265-266	+1.3	+1.3
256-257	-3.3	-1.3	261-262	+2.4	+1.8	266-267	-1.9	-0.6
257-258	+0.6	-0.7	262-263	-1.0	+0.8	267-268	-0.8	-1.4
258-259	+0.8	+0.1	263-264	-1.3	-0.5	268-269	-0.3	-1.7
259-260	-0.2	0.0	264-265	+0.6	0.0	269-270	+1.5	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
	div.	div.		div.	div.		div.	div.
270-271	+1.2	+1.2	275-276	+0.7	+0.7	280-281	+0.3	+0.3
271-272	+1.2	+2.4	276-277	-3.7	-3.0	281-282	-0.6	-0.3
272-273	+0.3	+2.7	277-278	+4.4	+1.4	282-283	-3.1	-3.4
273-274	-2.9	-0.2	278-279	-2.0	-0.6	283-284	+1.3	-2.1
274-275	+0.4	0.0	279-280	+0.4	0.0	284-285	+2.2	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
	div.	div.		div.	div.		div.	div.
285-286	+1.9	+1.9	290-291	-2.3	-2.3	295-296	+3.9	+3.9
286-287	-0.1	+1.8	291-292	-0.7	-3.0	296-297	-2.8	+1.1
287-288	-0.2	+1.6	292-293	-1.6	-4.6	297-298	+1.6	+2.7
288-289	+0.5	+2.1	293-294	+2.5	-2.1	298-299	-1.0	+1.7
289-290	-2.2	0.0	294-295	+2.3	0.0	299-300	-1.9	0.0

RELATIVE ERRORS OF THE SINGLE SPACES.—*Concluded.*

Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
	div.	div.		div.	div.		div.	div.
300-301	+1.6	+1.6	305-306	+0.9	+0.9	310-311	+0.7	+0.7
301-302	-3.1	-1.5	306-307	+1.2	+2.1	311-312	+0.1	+0.8
302-303	-0.2	-1.7	307-308	-0.9	+1.2	312-313	-1.3	-0.5
303-304	+0.7	-1.0	308-309	+0.5	+1.7	313-314	+2.3	+1.8
304-305	+1.1	0.0	309-310	-1.6	0.0	314-315	-1.8	0.0
Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.	Space.	Error of Space.	Total Error.
	div.	div.		div.	div.		div.	div.
315-316	-1.6	-1.6	320-321	+3.9	+3.9	325-326	-1.6	-1.6
316-317	-0.2	-1.8	321-322	-2.8	+1.1	326-327	+2.9	+1.3
317-318	+1.3	-0.5	322-323	-1.8	-0.7	327-328	+2.5	+3.8
318-319	-2.8	-3.3	323-324	-0.4	-1.1	328-329	-1.8	+2.0
319-320	+3.3	0.0	324-325	+1.1	0.0	329-330	-2.1	0.0
			Space.	Error of Space.	Total Error.			
				div.	div.			
			330-331	-0.9	-0.9			
			331-332	-2.7	-3.6			
			332-333	+1.5	-2.1			
			333-334	+2.4	+0.3			
			334-335	-0.2	0.0			

Professor Rogers finds that at  $62^{\circ}.0$  Fahrenheit

1 average space of the RUTHERFURD scale = 0.020859 inches.

From the above observations he has computed a table of corrections for every line of the scale. The corrections are expressed in *microns*, and in the computation the relation already given, viz:

1 micron = 5 div. of the microscope

has been used. The relation between the micron and the RUTHERFURD scale is:

1 average space of scale = 529.9 microns.

I have therefore divided the corrections given by Professor Rogers by 529.9, and thus obtained the following table of division error corrections, which must be added to readings of the scale. These corrections are expressed in terms of the average space as a unit; and will reduce the readings to what they would have been, if *all* the spaces were exactly equal to the average space.

## DIVISION ERROR CORRECTIONS: ADDITIVE TO OBSERVED READINGS.

Line.	Corr.	Line.	Corr.	Line.	Corr.	Line.	Corr.	Line.	Corr.
1	— .0023	51	+ .0028	101	+ .0015	151	+ .0234	201	+ .0276
2	— .0013	52	+ .0009	102	+ .0026	152	+ .0242	202	+ .0255
3	— .0015	53	+ .0009	103	+ .0028	153	+ .0248	203	+ .0248
4	+ .0004	54	+ .0019	104	+ .0026	154	— .0234	204	+ .0248
5	— .0004	55	— .0006	105	+ .0028	155	+ .0251	205	+ .0253
6	— .0011	56	+ .0021	106	+ .0030	156	+ .0257	206	+ .0266
7	+ .0006	57	+ .0036	107	+ .0034	157	+ .0253	207	+ .0274
8	+ .0008	58	+ .0036	108	+ .0036	158	+ .0242	208	+ .0265
9	— .0006	59	+ .0045	109	+ .0042	159	+ .0255	209	+ .0242
10	+ .0008	60	+ .0049	110	+ .0049	160	+ .0251	210	+ .0244
11	+ .0028	61	+ .0047	111	+ .0042	161	+ .0251	211	+ .0249
12	+ .0021	62	+ .0049	112	+ .0040	162	+ .0265	212	+ .0251
13	+ .0019	63	+ .0047	113	+ .0042	163	+ .0263	213	+ .0257
14	.0000	64	+ .0051	114	+ .0057	164	+ .0249	214	+ .0278
15	.0000	65	+ .0055	115	+ .0074	165	+ .0259	215	+ .0291
16	+ .0025	66	+ .0059	116	+ .0060	166	+ .0259	216	+ .0291
17	+ .0036	67	+ .0055	117	+ .0059	167	+ .0259	217	+ .0297
18	+ .0036	68	+ .0060	118	+ .0064	168	+ .0266	218	+ .0289
19	+ .0053	69	+ .0055	119	+ .0068	169	+ .0259	219	+ .0287
20	+ .0060	70	+ .0057	120	+ .0076	170	+ .0259	220	+ .0295
21	+ .0040	71	+ .0062	121	+ .0085	171	+ .0266	221	+ .0293
22	+ .0043	72	+ .0049	122	+ .0089	172	+ .0268	222	+ .0295
23	+ .0036	73	+ .0038	123	+ .0096	173	+ .0263	223	+ .0291
24	+ .0032	74	+ .0049	124	+ .0110	174	+ .0257	224	+ .0285
25	+ .0032	75	+ .0043	125	+ .0113	175	+ .0255	225	+ .0287
26	+ .0009	76	+ .0045	126	+ .0113	176	+ .0259	226	+ .0289
27	+ .0019	77	+ .0042	127	+ .0129	177	+ .0253	227	+ .0285
28	+ .0019	78	+ .0034	128	+ .0123	178	+ .0274	228	+ .0287
29	+ .0019	79	+ .0030	129	+ .0117	179	+ .0265	229	+ .0282
30	+ .0013	80	+ .0030	130	+ .0125	180	+ .0253	230	+ .0274
31	+ .0015	81	+ .0025	131	+ .0125	181	+ .0266	231	+ .0280
32	+ .0026	82	+ .0028	132	+ .0119	182	+ .0259	232	+ .0270
33	+ .0013	83	+ .0026	133	+ .0121	183	+ .0253	233	+ .0266
34	+ .0011	84	+ .0025	134	+ .0132	184	+ .0257	234	+ .0263
35	+ .0013	85	+ .0025	135	+ .0136	185	+ .0259	235	+ .0265
36	+ .0008	86	+ .0047	136	+ .0138	186	+ .0263	236	+ .0246
37	+ .0017	87	+ .0045	137	+ .0138	187	+ .0272	237	+ .0244
38	+ .0008	88	+ .0023	138	+ .0140	188	+ .0268	238	+ .0238
39	— .0008	89	+ .0026	139	+ .0147	189	+ .0259	239	+ .0229
40	.0000	90	+ .0028	140	+ .0168	190	+ .0253	240	+ .0238
41	+ .0002	91	+ .0021	141	+ .0187	191	+ .0251	241	+ .0248
42	— .0002	92	+ .0011	142	+ .0180	192	+ .0257	242	+ .0242
43	— .0004	93	+ .0013	143	+ .0197	193	+ .0265	243	+ .0242
44	.0000	94	+ .0025	144	+ .0198	194	+ .0270	244	+ .0234
45	— .0002	95	+ .0030	145	+ .0206	195	+ .0261	245	+ .0219
46	+ .0002	96	+ .0023	146	+ .0217	196	+ .0268	246	+ .0221
47	+ .0006	97	+ .0019	147	+ .0223	197	+ .0263	247	+ .0219
48	+ .0006	98	+ .0021	148	+ .0232	198	+ .0263	248	+ .0200
49	+ .0006	99	+ .0017	149	+ .0240	199	+ .0268	249	+ .0195
50	+ .0015	100	+ .0017	150	+ .0231	200	+ .0272	250	+ .0164



DIVISION ERROR CORRECTIONS.—*Continued.*

Line.	Corr.	Line.	Corr.	Line.	Corr.	Line.	Corr.
251	+.0159	271	+.0079	291	— .0023	311	+.0009
252	+.0142	272	+.0079	292	— .0028	312	+.0009
253	+.0142	273	+.0074	293	— .0036	313	+.0004
254	+.0136	274	+.0057	294	— .0028	314	+.0008
255	+.0142	275	+.0053	295	— .0023	315	+.0006
256	+.0146	276	+.0055	296	— .0008	316	.0000
257	+.0130	277	+.0038	297	— .0017	317	— .0002
258	+.0130	278	+.0055	298	— .0011	318	+.0002
259	+.0130	279	+.0045	299	— .0015	319	— .0008
260	+.0127	280	+.0047	300	— .0023	320	+.0004
261	+.0119	281	+.0042	301	— .0013	321	+.0017
262	+.0125	282	+.0032	302	— .0023	322	+.0006
263	+.0115	283	+.0015	303	— .0023	323	— .0002
264	+.0106	284	+.0013	304	— .0017	324	— .0004
265	+.0104	285	+.0015	305	— .0011	325	.0000
266	+.0104	286	+.0017	306	— .0004	326	— .0006
267	+.0093	287	+.0011	307	+.0004	327	+.0006
268	+.0081	288	+.0004	308	+.0004	328	+.0015
269	+.0076	289	.0000	309	+.0009	329	+.0008
270	+.0079	290	— .0013	310	+.0006	330	.0000

When the scale was graduated, line 154 was omitted and afterwards inserted. This accounts for its apparently discordant division error.

## CORRECTION FOR RUNS

The following table contains the correction for runs, which has been applied to all the Pleiades observations. The values are derived from an extended series of measures of all the 330 spaces of the scale. The corrections are very minute, and it is probable that the final results would not have been sensibly affected, had this correction been entirely neglected.

## CORRECTION FOR RUNS. ADDITIVE TO OBSERVED READINGS.

Fraction of Space.	Corr.	Fraction of Space.	Corr.	Fraction of Space.	Corr.	Fraction of Space.	Corr.
.00	+.0000	.25	+.0006	.50	+.0012	.75	+.0018
.01	+.0000	.26	+.0006	.51	+.0013	.76	+.0019
.02	+.0000	.27	+.0007	.52	+.0013	.77	+.0019
.03	+.0001	.28	+.0007	.53	+.0013	.78	+.0019
.04	+.0001	.29	+.0007	.54	+.0013	.79	+.0019
.05	+.0001	.30	+.0007	.55	+.0014	.80	+.0020
.06	+.0001	.31	+.0008	.56	+.0014	.81	+.0020
.07	+.0001	.32	+.0008	.57	+.0014	.82	+.0020
.08	+.0002	.33	+.0008	.58	+.0014	.83	+.0020
.09	+.0002	.34	+.0008	.59	+.0015	.84	+.0021
.10	+.0002	.35	+.0009	.60	+.0015	.85	+.0021
.11	+.0003	.36	+.0009	.61	+.0015	.86	+.0021
.12	+.0003	.37	+.0009	.62	+.0015	.87	+.0021
.13	+.0003	.38	+.0009	.63	+.0015	.88	+.0022
.14	+.0003	.39	+.0010	.64	+.0016	.89	+.0022
.15	+.0004	.40	+.0010	.65	+.0016	.90	+.0022
.16	+.0004	.41	+.0010	.66	+.0016	.91	+.0022
.17	+.0004	.42	+.0010	.67	+.0016	.92	+.0023
.18	+.0004	.43	+.0011	.68	+.0017	.93	+.0023
.19	+.0005	.44	+.0011	.69	+.0017	.94	+.0023
.20	+.0005	.45	+.0011	.70	+.0017	.95	+.0023
.21	+.0005	.46	+.0011	.71	+.0017	.96	+.0024
.22	+.0005	.47	+.0012	.72	+.0018	.97	+.0024
.23	+.0006	.48	+.0012	.73	+.0018	.98	+.0024
.24	+.0006	.49	+.0012	.74	+.0018	.99	+.0024

As an example of the application of the run and division error corrections, let us take the measures of *Merope* on plate 16 East. The observation book gives:

	Scale Reading on <i>Merope</i> .	Scale Reading on 24 p.	Scale Distance.	Mean.
Direct . . .	162.1006	125.0932	37.0074	36.9986
Reversed . . .	88.0903	125.0801	36.9898	

The corrections then are:

CORRECTION FOR RUNS.		CORRECTION FOR DIVISION ERROR.	
Direct.	Reversed.	Direct.	Reversed.
Arg., .1006, +.0002.	Arg., .0801, +.0002	Arg., 162, +.0265.	Arg., 125, +.0113
Arg., .0932, +.0002.	Arg., .0903, +.0002	Arg., 125, +.0113.	Arg., 88, +.0023
Difference +.0000	+.0000	Difference +.0152	+.0090
Mean . . . . .	+.0000	Mean . . . . .	+.0121

We have therefore:

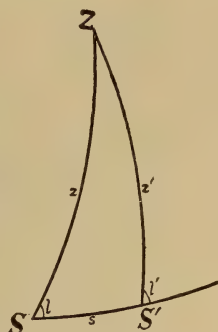
Mean of observed distances . . . . .	36.9986
Correction for runs . . . . .	+.0.0000
“ “ division error . . . . .	+.0.0121
Corrected distance . . . . .	37.0107

## III.

## CORRECTION FOR REFRACTION.

THE calculation of the refraction corrections, in itself somewhat laborious, can be much facilitated by the use of special formulæ and tables. The usual Besselian refraction formulæ are not very well adapted to the reduction of photographic measures. For the photographic plate gives us the position angle *at the central star*, or at the centre of the plate, while the Besselian formulæ require the use of the position angle at the point midway between the two stars. A special correction is needed, then, in photographic work, to obtain this latter position angle, which is itself of no further interest. Moreover, several quantities which would be different for every star when using the Besselian formulæ, can be made constant for the whole plate by means of the formulæ now to be deduced.

Let us consider the spherical triangle formed by the zenith ( $Z$ ), the central star ( $S$ ), and the star under observation ( $S'$ ). Let  $z$  and  $z'$  be the zenith distances of the two stars, and let  $l$  and  $l'$  be the angles which  $SS'$  makes with the vertical circles at  $S$  and  $S'$ . All the quantities in the figure are *apparent*; *i. e.*, their values are supposed to be uncorrected for refraction. The effect of refraction is to vary  $z$  and  $z'$  while the angle at  $Z$  remains unchanged. We are to determine the consequent variations of  $s$  and  $l$ . Now we can expand these variations in terms of the variations of  $z$  and  $z'$  by means of the general formula :



$$\Delta\phi(x, y) = \frac{d\phi}{dx} \Delta x + \frac{d\phi}{dy} \Delta y + \frac{1}{2} \frac{d^2\phi}{dx^2} \Delta x^2 + \frac{d^2\phi}{dx dy} \Delta x \Delta y + \frac{1}{2} \frac{d^2\phi}{dy^2} \Delta y^2 + \dots \quad (a)$$

If we do so, we shall have, omitting only certain very minute terms of the third order:\*

$$\left. \begin{aligned} \sigma - s &= r \cos l - r' \cos l' \\ s(\lambda - l) &= -r \sin l + r' \sin l' \end{aligned} \right\} (b)$$

in which  $\sigma$  and  $\lambda$  are the values of  $s$  and  $l$  *after* correction for refraction, and  $r$  and  $r'$  the vertical refractions of  $S$  and  $S'$ . The details of the rigorous deduction of equations (b) are omitted here, for the sake of brevity. But the equations as they stand can easily be obtained by an inspection of the figure.

Equations (b) are extremely accurate, as well as simple in form; but they are inconvenient for practical purposes since they involve  $r'$  and  $l'$ , quantities which are different for every star on the plate. We shall therefore find expressions for  $r'$  and  $l'$  in a more convenient form, and at the same time introduce the quantities  $s$  and  $z$  into the second members of the equations. The expansions will be carried to terms in  $s^2$  inclusive. Following BESSEL, we put:

$$r = k \tan z, \quad r' = k' \tan z',$$

where  $k$  and  $k'$  are the usual refraction quantities with the argument "apparent zenith distance." We may also write:

$$k' - k = \frac{dk}{dz} (z' - z)$$

and therefore:

$$r' = k \tan z' + \frac{dk}{dz} \tan z' (z' - z)$$

Moreover:

$$\begin{aligned} \tan z' &= \tan z + (z' - z) \sec^2 z + (z' - z)^2 \tan z \sec^2 z \dots \\ \cos l' &= \cos l - (l' - l) \sin l - \frac{1}{2} (l' - l)^2 \cos l \dots \\ \sin l' &= \sin l + (l' - l) \cos l - \frac{1}{2} (l' - l)^2 \sin l \dots \end{aligned}$$

We also have, to terms of the second order, inclusive:†

$$\begin{aligned} z' - z &= -s \cos l + \frac{1}{2} s^2 \sin^2 l \cot z \\ l' - l &= s \sin l \cot z + \frac{1}{2} s^2 \sin l \cos l (1 + 2 \cot^2 z) \end{aligned}$$

\* While the present investigation was being printed, Professor Newcomb called my attention to an investigation of differential refraction, in which he has used fundamental formulæ somewhat similar to equations (b). I was not previously aware of this work of Professor Newcomb's, which was published in his Report on the Transit of Venus, Dec. 8-9, 1874 (Ex. Doc., U. S. Senate, 1879).

† For a demonstration of these formulæ, see Jordan, *Handbuch der Vermessungskunde*, dritte Auflage, 1890, vol. iii, p. 313.



If we substitute the values from the last equations in the preceding ones, and then in (b), we obtain :

$$\begin{aligned}\sigma - s = & + k \sec^2 z \cos^2 l.s - \frac{1}{2} k \sec^2 z \cot z \cos l \sin^2 l.s^2 \\ & + k \sin^2 l.s + \frac{1}{2} k \tan z (1 + 2 \cot^2 z) \cos l \sin^2 l.s^2 \\ & + \frac{dk}{dz} \tan z \cos^2 l.s - k \tan z \sec^2 z \cos^3 l.s^2 \\ & + \frac{1}{2} k \cot z \cos l \sin^2 l.s^2 \\ & - k \sec^2 z \cot z \cos l \sin^2 l.s^2\end{aligned}$$

$$\begin{aligned}s(\lambda - l) = & - k \sec^2 z \sin l \cos l.s + \frac{1}{2} k \sec^2 z \cot z \sin^3 l.s^2 \\ & + k \sin l \cos l.s + \frac{1}{2} k \tan z (1 + 2 \cot^2 z) \sin l \cos^2 l.s^2 \\ & - \frac{dk}{dz} \tan z \sin l \cos l.s + k \sec^2 z \tan z \sin l \cos^2 l.s^2 \\ & - k \sec^2 z \cot z \sin l \cos^2 l.s^2 \\ & - \frac{1}{2} k \cot z \sin^3 l.s^2\end{aligned}$$

Introducing auxiliary quantities and simplifying, these equations can be written :

$$\left. \begin{aligned}\sigma - s &= s k [\tan^2 z \cos^2 l + 1] + A s + B s^2 \\ \lambda - l &= -k \tan^2 z \sin l \cos l + A' + B' s\end{aligned} \right\} (c)$$

where

$$A = \frac{dk}{dz} \tan z \cos^2 l$$

$$B = -k \tan z \cos l - k \tan^3 z \cos^3 l$$

$$A' = -\frac{dk}{dz} \tan z \sin l \cos l$$

$$B' = \frac{1}{2} k \tan z \sin l + k \tan^3 z \sin l - k \tan^3 z \sin^3 l$$

The auxiliary quantities  $A$ ,  $B$ ,  $A'$  and  $B'$ , which are very minute, can be taken from the following tables, in using which  $s$  is to be considered expressed in seconds of arc. It has not appeared necessary to extend these tables beyond the zenith distance  $63^\circ$ , the logarithmic tangent of which is 0.3, since this will probably include all the RUTHERFURD photographs of star clusters, as well as any others that may be made for comparison with them.

I may add that these tables afford a much more convenient solution than the method previously published by me,\* in which the problem was treated in an entirely different way.

\* *Astronomical Journal*, vol. x, p. 163.

## GENERAL REFRACTION TABLES.

Table of $A \times 10^3$ .					Table of $B \times 10^6$ .				
$l$	Log. tan. $z$ .				$l$	Log. tan. $z$ .			
	0.0	0.1	0.2	0.3		0.0	0.1	0.2	0.3
0°	-.001	-.003	-.006	-.012	0°	-.0028	-.0044	-.0075	-.0134
10	-.001	-.002	-.006	-.012	10	-.0026	-.0043	-.0073	-.0129
20	-.001	-.002	-.005	-.011	20	-.0024	-.0038	-.0065	-.0114
30	-.001	-.002	-.005	-.009	30	-.0021	-.0033	-.0054	-.0092
40	-.001	-.001	-.004	-.007	40	-.0016	-.0025	-.0040	-.0069
50	-.001	-.001	-.003	-.005	50	-.0013	-.0018	-.0028	-.0045
60	.000	-.001	-.002	-.003	60	-.0009	-.0012	-.0018	-.0027
70	.000	.000	-.001	-.001	70	-.0006	-.0007	-.0009	-.0013
80	.000	.000	.000	.000	80	-.0002	-.0003	-.0004	-.0006
90	.000	.000	.000	.000	90	.0000	.0000	.0000	.0000
100	.000	.000	.000	.000	100	+.0002	+.0003	+.0004	+.0006
110	.000	.000	-.001	-.001	110	+.0006	+.0007	+.0009	+.0013
120	.000	-.001	-.002	-.003	120	+.0009	+.0012	+.0018	+.0027
130	-.001	-.001	-.003	-.005	130	+.0013	+.0018	+.0028	+.0045
140	-.001	-.001	-.004	-.007	140	+.0016	+.0025	+.0040	+.0069
150	-.001	-.002	-.005	-.009	150	+.0021	+.0033	+.0054	+.0092
160	-.001	-.002	-.005	-.011	160	+.0024	+.0038	+.0065	+.0114
170	-.001	-.002	-.006	-.012	170	+.0026	+.0043	+.0073	+.0129
180	-.001	-.003	-.006	-.012	180	+.0028	+.0044	+.0075	+.0134
190	-.001	-.002	-.006	-.012	190	+.0026	+.0043	+.0073	+.0129
200	-.001	-.002	-.005	-.011	200	+.0024	+.0038	+.0065	+.0114
210	-.001	-.002	-.005	-.009	210	+.0021	+.0033	+.0054	+.0092
220	-.001	-.001	-.004	-.007	220	+.0016	+.0025	+.0040	+.0069
230	-.001	-.001	-.003	-.005	230	+.0013	+.0018	+.0028	+.0045
240	.000	-.001	-.002	-.003	240	+.0009	+.0012	+.0018	+.0027
250	.000	.000	-.001	-.001	250	+.0006	+.0007	+.0009	+.0013
260	.000	.000	.000	.000	260	+.0002	+.0003	+.0004	+.0006
270	.000	.000	.000	.000	270	.0000	.0000	.0000	.0000
280	.000	.000	.000	.000	280	-.0002	-.0003	-.0004	-.0006
290	.000	.000	-.001	-.001	290	-.0006	-.0007	-.0009	-.0013
300	.000	-.001	-.002	-.003	300	-.0009	-.0012	-.0018	-.0027
310	-.001	-.001	-.003	-.005	310	-.0013	-.0018	-.0028	-.0045
320	-.001	-.001	-.004	-.007	320	-.0016	-.0025	-.0040	-.0069
330	-.001	-.002	-.005	-.009	330	-.0021	-.0033	-.0054	-.0092
340	-.001	-.002	-.005	-.011	340	-.0024	-.0038	-.0065	-.0114
350	-.001	-.002	-.006	-.012	350	-.0026	-.0043	-.0073	-.0129

GENERAL REFRACTION TABLES.—*Continued.*

Table of $A'$ .					Table of $B' \times 10^3$ .				
$l$	Log. tan. $z$ .				$l$	Log. tan. $z$ .			
	0.0	0.1	0.2	0.3		0.0	0.1	0.2	0.3
0°	0.0	0.0	0.0	0.0	0°	.00	.00	.00	.00
10	0.0	+0.1	+0.2	+0.4	10	+.06	+.11	+.20	+.37
20	+0.1	+0.1	+0.4	+0.8	20	+.11	+.19	+.32	+.59
30	+0.1	+0.1	+0.5	+1.1	30	+.14	+.23	+.39	+.69
40	+0.1	+0.2	+0.6	+1.3	40	+.15	+.24	+.40	+.69
50	+0.1	+0.2	+0.6	+1.3	50	+.16	+.23	+.37	+.61
60	+0.1	+0.1	+0.5	+1.1	60	+.15	+.22	+.32	+.50
70	+0.1	+0.1	+0.4	+0.8	70	+.15	+.20	+.27	+.39
80	0.0	+0.1	+0.2	+0.4	80	+.14	+.18	+.23	+.31
90	0.0	0.0	0.0	0.0	90	+.14	+.18	+.22	+.28
100	0.0	—0.1	—0.2	—0.4	100	+.14	+.18	+.23	+.31
110	—0.1	—0.1	—0.4	—0.8	110	+.15	+.20	+.27	+.39
120	—0.1	—0.1	—0.5	—1.1	120	+.15	+.22	+.32	+.50
130	—0.1	—0.2	—0.6	—1.3	130	+.16	+.23	+.37	+.61
140	—0.1	—0.2	—0.6	—1.3	140	+.15	+.24	+.40	+.69
150	—0.1	—0.1	—0.5	—1.1	150	+.14	+.23	+.39	+.69
160	—0.1	—0.1	—0.4	—0.8	160	+.11	+.19	+.32	+.59
170	0.0	—0.1	—0.2	—0.4	170	+.06	+.11	+.20	+.37
180	0.0	0.0	0.0	0.0	180	.00	.00	.00	.00
190	0.0	+0.1	+0.2	+0.4	190	—0.06	—0.11	—0.20	—0.37
200	+0.1	+0.1	+0.4	+0.8	200	—0.11	—0.19	—0.32	—0.59
210	+0.1	+0.1	+0.5	+1.1	210	—0.14	—0.23	—0.39	—0.69
220	+0.1	+0.2	+0.6	+1.3	220	—0.15	—0.24	—0.40	—0.69
230	+0.1	+0.2	+0.6	+1.3	230	—0.16	—0.23	—0.37	—0.61
240	+0.1	+0.1	+0.5	+1.1	240	—0.15	—0.22	—0.32	—0.50
250	+0.1	+0.1	+0.4	+0.8	250	—0.15	—0.20	—0.27	—0.39
260	0.0	+0.1	+0.2	+0.4	260	—0.14	—0.18	—0.23	—0.31
270	0.0	0.0	0.0	0.0	270	—0.14	—0.18	—0.22	—0.28
280	0.0	—0.1	—0.2	—0.4	280	—0.14	—0.18	—0.23	—0.31
290	—0.1	—0.1	—0.4	—0.8	290	—0.15	—0.20	—0.27	—0.39
300	—0.1	—0.1	—0.5	—1.1	300	—0.15	—0.22	—0.32	—0.50
310	—0.1	—0.2	—0.6	—1.3	310	—0.16	—0.23	—0.37	—0.61
320	—0.1	—0.2	—0.6	—1.3	320	—0.15	—0.24	—0.40	—0.69
330	—0.1	—0.1	—0.5	—1.1	330	—0.14	—0.23	—0.39	—0.69
340	—0.1	—0.1	—0.4	—0.8	340	—0.11	—0.19	—0.32	—0.59
350	0.0	—0.1	—0.2	—0.4	350	—0.06	—0.11	—0.30	—0.37

We sometimes need the correction for the position angle  $p$  instead of that for  $l$ , which is given by equations (c). For that purpose we introduce the parallactic angle  $q$ , and write finally:

$$\left. \begin{aligned} \sigma - s &= s k \sin 1'' [\tan^2 z \cos^2 (p - q) + 1] + A s + B s^2 \\ \pi - p &= -k \tan^2 z \sin (p - q) \cos (p - q) - k \tan z \sin q \tan \delta + A' + B' s \end{aligned} \right\} (d)$$

The term

$$-k \tan z \sin q \tan \delta$$

is the usual term introduced for the purpose in question.\* It will also be noticed that  $p - q$  has been substituted for its equivalent  $l$ ; and that the factor  $\sin 1''$  has been introduced in order that we may use  $s$  expressed in seconds of arc. This last change must also be made in equations (c) if we apply them to any practical case. It will be noticed that the formulæ (d) are very similar in form to those of BESSEL, from which they differ by the use of  $k$  instead of  $\kappa$ , and  $z$  (the apparent zenith distance) instead of  $\zeta$  (the true zenith distance). If, following BESSEL, we introduce  $\kappa$  by means of the equation:†

$$\kappa \tan^2 \zeta = k \tan^2 z + \frac{dk}{dz} \tan z$$

we can write (c) in the form:

$$\begin{aligned} \sigma - s &= s \kappa [\tan^2 \zeta \cos^2 l + 1] + s(k - \kappa) + B s^2 \\ \lambda - l &= -\kappa \tan^2 \zeta \sin l \cos l + B' s \end{aligned}$$

The following little table gives the values of  $(k - \kappa)$  for various values of  $\tan z$ .

Log $\tan z$	$(k - \kappa) \times 10^3$
0.0	+ .0016
0.1	+ .0023
0.2	+ .0028
0.3	+ .0040
0.4	+ .0059

It is plain from this table and the preceding ones, that for the reduction of the present *Pleiades* plates we may neglect the term in  $k - \kappa$ , as well as those in  $B$  and  $B'$ . We may therefore write our formulæ:

$$\left. \begin{aligned} \sigma - s &= s \kappa [\tan^2 \zeta \cos^2 (p - q) + 1] \\ \lambda - l &= -\kappa \operatorname{cosec} 1'' \tan^2 \zeta \sin l \cos l \end{aligned} \right\} (e)$$

\* Bessel, *Astronomische Untersuchungen*, vol. i, p. 165.

† Loc. cit., p. 157.



In reducing the RUTHERFURD plates it will not be necessary to pay any attention to the term

$$-k \tan z \sin q \tan \delta$$

already referred to above. For this term is a constant correction to all the position angles of any given plate. It will therefore affect the determination of the zero of position angles by the same amount as it does the position angle of any star. Its effect upon the difference will therefore be *nil*. Finally, then, we may correct all the distances and position angles by means of the following formulæ:

$$\left. \begin{aligned} \sigma - s &= s \kappa [\tan^2 \zeta \cos^2 (p - q) + 1] \\ \pi - p &= -\kappa \operatorname{cosec} 1'' \tan^2 \zeta \sin (p - q) \cos (p - q) \end{aligned} \right\} (f)$$

but in the case of plates taken at considerable zenith distances, it would be necessary to employ the more accurate formulæ (*c*), and the tables adapted to them.

In practice it has been found convenient to prepare special tables of  $\frac{\sigma - s}{s}$  and  $\pi - p$  for each plate. The argument of these tables is  $p$ . The quantities were first computed for every  $10^\circ$  of  $p - q$  and then tabulated for every  $10^\circ$  of  $p$ . They are strictly tables of single entry, since  $\zeta$  and  $q$  are constants for the whole plate. The refraction corrections were then taken from the tables by inspection, the multiplication of the distance-refraction factor being effected with CRELLE'S tables. The special refraction tables are given here to facilitate any possible computations that may hereafter be undertaken in connection with the RUTHERFURD plates.

It should perhaps be mentioned that a doubt exists as to whether the Eastern or Western impression was made first, at the time of observation. A careful consideration of all the existing evidence on this point has led me to take the Eastern impression as the one made first, and it is so marked in the table at the end of I. But it is proper to say here that the final results would not be influenced, if I had assumed the Western impressions as the earlier ones. The effect of this assumption would be to interchange the letters W. and E. in the table at the end of I., and the words *West* and *East* in the headings of the tables now to be given. But since both impressions have been made and measured, in the case of every star, and on every plate, the mean of the results would not be affected by interchanging the refraction corrections.

## SPECIAL REFRACTION TABLES.

Plate 16 East.			Plate 16 West.			Plate 17 East.		
<i>p.</i>	$\frac{\sigma-s}{s} \times 10^3.$	$\pi - p.$	<i>p.</i>	$\frac{\sigma-s}{s} \times 10^3.$	$\pi - p.$	<i>p.</i>	$\frac{\sigma-s}{s} \times 10^3.$	$\pi - p.$
49°	+.396	0.0	50°	+.404	0.0	53°	+.457	0.0
59	+.393	— 3.6	60	+.401	— 3.9	63	+.451	— 5.8
69	+.384	— 6.8	70	+.392	— 7.4	73	+.437	—10.9
79	+.369	— 9.1	80	+.375	—10.0	83	+.416	—14.6
89	+.352	—10.3	90	+.357	—11.3	93	+.390	—16.6
99	+.334	—10.3	100	+.340	—11.3	103	+.360	—16.6
109	+.319	— 9.1	110	+.320	—10.0	113	+.334	—14.6
119	+.305	— 6.8	120	+.306	— 7.4	123	+.312	—10.9
129	+.296	— 3.6	130	+.296	— 3.9	133	+.299	— 5.8
139	+.293	0.0	140	+.293	0.0	143	+.293	0.0
149	+.296	+ 3.6	150	+.296	+ 3.9	153	+.299	+ 5.8
159	+.305	+ 6.8	160	+.306	+ 7.4	163	+.312	+10.9
169	+.319	+ 9.1	170	+.320	+10.0	173	+.334	+14.6
179	+.334	+10.3	180	+.340	+11.3	183	+.360	+16.6
189	+.352	+10.3	190	+.357	+11.3	193	+.390	+16.6
199	+.369	+ 9.1	200	+.375	+10.0	203	+.416	+14.6
209	+.384	+ 6.8	210	+.392	+ 7.4	213	+.437	+10.9
219	+.393	+ 3.6	220	+.401	+ 3.9	223	+.451	+ 5.8
229	+.396	0.0	230	+.404	0.0	233	+.457	0.0
239	+.393	— 3.6	240	+.401	— 3.9	243	+.451	— 5.8
249	+.384	— 6.8	250	+.392	— 7.4	253	+.437	—10.9
259	+.369	— 9.1	260	+.375	—10.0	263	+.416	—14.6
269	+.352	—10.3	270	+.357	—11.3	273	+.390	—16.6
279	+.334	—10.3	280	+.340	—11.3	283	+.360	—16.6
289	+.319	— 9.1	290	+.320	—10.0	293	+.334	—14.6
299	+.305	— 6.8	300	+.306	— 7.4	303	+.312	—10.9
309	+.296	— 3.6	310	+.296	— 3.9	313	+.299	— 5.8
319	+.293	0.0	320	+.293	0.0	323	+.293	0.0
329	+.296	+ 3.6	330	+.296	+ 3.9	333	+.299	+ 5.8
339	+.305	+ 6.8	340	+.306	+ 7.4	343	+.312	+10.9
349	+.319	+ 9.1	350	+.320	+10.0	353	+.334	+14.6
359	+.334	+10.3	0	+.340	+11.3	3	+.360	+16.6
9	+.352	+10.3	10	+.357	+11.3	13	+.390	+16.6
19	+.369	+ 9.1	20	+.375	+10.0	23	+.416	+14.6
29	+.384	+ 6.8	30	+.392	+ 7.4	33	+.437	+10.9
39	+.393	+ 3.6	40	+.401	+ 3.9	43	+.451	+ 5.8

## SPECIAL REFRACTION TABLES.—Continued.

Plate 17 West.			Plate 18 East.			Plate 18 West.		
$p.$	$\frac{\sigma-s}{s} \times 10^3.$	$\pi-p.$	$p.$	$\frac{\sigma-s}{s} \times 10^3.$	$\pi-p.$	$p.$	$\frac{\sigma-s}{s} \times 10^3.$	$\pi-p.$
53°	+470	0.0	21°	+326	0.0	24°	+326	0.0
63	+466	— 6.3	31	+325	—1.2	34	+325	—1.2
73	+448	—11.8	41	+323	—2.2	44	+323	—2.3
83	+425	—15.8	51	+318	—2.9	54	+318	—3.1
93	+397	—18.0	61	+314	—3.3	64	+315	—3.5
103	+366	—18.0	71	+309	—3.3	74	+309	—3.5
113	+337	—15.8	81	+303	—2.9	84	+303	—3.1
123	+314	—11.8	91	+297	—2.2	94	+297	—2.3
133	+299	— 6.3	101	+294	—1.2	104	+295	—1.2
143	+293	0.0	111	+294	0.0	114	+294	0.0
153	+299	+ 6.3	121	+294	+1.2	124	+295	+1.2
163	+314	+11.8	131	+297	+2.2	134	+297	+2.3
173	+337	+15.8	141	+303	+2.9	144	+303	+3.1
183	+366	+18.0	151	+309	+3.3	154	+309	+3.5
193	+397	+18.0	161	+314	+3.3	164	+315	+3.5
203	+425	+15.8	171	+318	+2.9	174	+318	+3.1
213	+448	+11.8	181	+323	+2.2	184	+323	+2.3
223	+466	+ 6.3	191	+325	+1.2	194	+325	+1.2
233	+470	0.0	201	+326	0.0	204	+326	0.0
243	+466	— 6.3	211	+325	—1.2	214	+325	—1.2
253	+448	—11.8	221	+323	—2.2	224	+323	—2.3
263	+425	—15.8	231	+318	—2.9	234	+318	—3.1
273	+397	—18.0	241	+314	—3.3	244	+315	—3.5
283	+366	—18.0	251	+309	—3.3	254	+309	—3.5
293	+337	—15.8	261	+303	—2.9	264	+303	—3.1
303	+314	—11.8	271	+297	—2.2	274	+297	—2.3
313	+299	— 6.3	281	+294	—1.2	284	+295	—1.2
323	+293	0.0	291	+294	0.0	294	+294	0.0
333	+299	+ 6.3	301	+294	+1.2	304	+295	+1.2
343	+314	+11.8	311	+297	+2.2	314	+297	+2.3
353	+337	+15.8	321	+303	+2.9	324	+303	+3.1
3	+366	+18.0	331	+309	+3.3	334	+309	+3.5
13	+397	+18.0	341	+314	+3.3	344	+315	+3.5
23	+425	+15.8	351	+318	+2.9	354	+318	+3.1
33	+448	+11.8	I	+323	+2.2	4	+323	+2.3
43	+466	+ 6.3	II	+325	+1.2	14	+325	+1.2

## SPECIAL REFRACTION TABLES.—Continued.

Plate 19 East.			Plate 19 West.			Plate 20 East.		
$p.$	$\frac{\sigma-s}{s} \times 10^3.$	$\pi-p.$	$p.$	$\frac{\sigma-s}{s} \times 10^3.$	$\pi-p.$	$p.$	$\frac{\sigma-s}{s} \times 10^3.$	$\pi-p.$
304°	+724	0.0	304°	+690	0.0	305°	+558	0.0
314	+710	-15.4	314	+675	-14.2	315	+549	-9.6
324	+675	-29.0	324	+641	-26.7	325	+526	-18.1
334	+610	-39.1	334	+587	-36.0	335	+489	-24.3
344	+541	-44.4	344	+522	-41.0	345	+446	-27.7
354	+466	-44.4	354	+452	-41.0	355	+398	-27.7
4	+393	-39.1	4	+385	-36.0	5	+355	-24.3
14	+336	-29.0	14	+333	-26.7	15	+317	-18.1
24	+299	-15.4	24	+296	-14.2	25	+295	-9.6
34	+285	0.0	34	+285	0.0	35	+286	0.0
44	+299	+15.4	44	+296	+14.2	45	+295	+9.6
54	+336	+29.0	54	+333	+26.7	55	+317	+18.1
64	+393	+39.1	64	+385	+36.0	65	+355	+24.3
74	+466	+44.4	74	+452	+41.0	75	+398	+27.7
84	+541	+44.4	84	+522	+41.0	85	+446	+27.7
94	+610	+39.1	94	+587	+36.0	95	+489	+24.3
104	+675	+29.0	104	+641	+26.7	105	+526	+18.1
114	+710	+15.4	114	+675	+14.2	115	+549	+9.6
124	+724	0.0	124	+690	0.0	125	+558	0.0
134	+710	-15.4	134	+675	-14.2	135	+549	-9.6
144	+675	-29.0	144	+641	-26.7	145	+526	-18.1
154	+610	-39.1	154	+587	-36.0	155	+489	-24.3
164	+541	-44.4	164	+522	-41.0	165	+446	-27.7
174	+466	-44.4	174	+452	-41.0	175	+398	-27.7
184	+393	-39.1	184	+385	-36.0	185	+355	-24.3
194	+336	-29.0	194	+333	-26.7	195	+317	-18.1
204	+299	-15.4	204	+296	-14.2	205	+295	-9.6
214	+285	0.0	214	+285	0.0	215	+286	0.0
224	+299	+15.4	224	+296	+14.2	225	+295	+9.6
234	+336	+29.0	234	+333	+26.7	235	+317	+18.1
244	+393	+39.1	244	+385	+36.0	245	+355	+24.3
254	+466	+44.4	254	+452	+41.0	255	+398	+27.7
264	+541	+44.4	264	+522	+41.0	265	+446	+27.7
274	+610	+39.1	274	+587	+36.0	275	+489	+24.3
284	+675	+29.0	284	+641	+26.7	285	+526	+18.1
294	+710	+15.4	294	+675	+14.2	295	+549	+9.6



## SPECIAL REFRACTION TABLES.—Continued.

Plate 20 West.			Plate 21 East.			Plate 21 West.		
<i>p.</i>	$\frac{\sigma-s}{s} \times 10^3.$	$\pi-p.$	<i>p.</i>	$\frac{\sigma-s}{s} \times 10^3.$	$\pi-p.$	<i>p.</i>	$\frac{\sigma-s}{s} \times 10^3.$	$\pi-p.$
305°	+538	0.0	306°	+463	0.0	307°	+450	0.0
315	+529	— 8.9	316	+458	— 6.3	317	+446	— 5.8
325	+509	—16.7	326	+443	—11.8	327	+432	—10.9
335	+474	—22.4	336	+420	—15.9	337	+409	—14.6
345	+434	—25.5	346	+390	—18.1	347	+383	—16.6
355	+389	—25.5	356	+360	—18.1	357	+355	—16.6
5	+349	—22.4	6	+330	—15.9	7	+326	—14.6
15	+315	—16.7	16	+306	—11.8	17	+306	—10.9
25	+295	— 8.9	26	+292	— 6.3	27	+291	— 5.8
35	+286	0.0	36	+286	0.0	37	+286	0.0
45	+295	+ 8.9	46	+292	+ 6.3	47	+291	+ 5.8
55	+315	+16.7	56	+306	+11.8	57	+306	+10.9
65	+349	+22.4	66	+330	+15.9	67	+326	+14.6
75	+389	+25.5	76	+360	+18.1	77	+355	+16.6
85	+434	+25.5	86	+390	+18.1	87	+383	+16.6
95	+474	+22.4	96	+420	+15.9	97	+409	+14.6
105	+509	+16.7	106	+443	+11.8	107	+432	+10.9
115	+529	+ 8.9	116	+458	+ 6.3	117	+446	+ 5.8
125	+538	0.0	126	+463	0.0	127	+450	0.0
135	+529	— 8.9	136	+458	— 6.3	137	+446	— 5.8
145	+509	—16.7	146	+443	—11.8	147	+432	—10.9
155	+474	—22.4	156	+420	—15.9	157	+409	—14.6
165	+434	—25.5	166	+390	—18.1	167	+383	—16.6
175	+389	—25.5	176	+360	—18.1	177	+355	—16.6
185	+349	—22.4	186	+330	—15.9	187	+326	—14.6
195	+315	—16.7	196	+306	—11.8	197	+306	—10.9
205	+295	— 8.9	206	+292	— 6.3	207	+291	— 5.8
215	+286	0.0	216	+286	0.0	217	+286	0.0
225	+295	+ 8.9	226	+292	+ 6.3	227	+291	+ 5.8
235	+315	+16.7	236	+306	+11.8	237	+306	+10.9
245	+349	+22.4	246	+330	+15.9	247	+326	+14.6
255	+389	+25.5	256	+360	+18.1	257	+355	+16.6
265	+434	+25.5	266	+390	+18.1	267	+383	+16.6
275	+474	+22.4	276	+420	+15.9	277	+409	+14.6
285	+509	+16.7	286	+443	+11.8	287	+432	+10.9
295	+529	+ 8.9	296	+458	+ 6.3	297	+446	+ 5.8

SPECIAL REFRACTION TABLES.—*Continued.*

Plate 22 East.			Plate 22 West.			Plate 23 East.		
$p.$	$\frac{\sigma-s}{s} \times 10^3.$	$\pi-p.$	$p.$	$\frac{\sigma-s}{s} \times 10^3.$	$\pi-p.$	$p.$	$\frac{\sigma-s}{s} \times 10^3.$	$\pi-p.$
309°	+422	0.0	310°	+410	0.0	314°	+376	0.0
319	+417	— 4.5	320	+407	— 4.2	324	+375	—2.9
329	+407	— 8.5	330	+398	— 7.8	334	+366	—5.5
339	+390	—11.4	340	+381	—10.6	344	+354	—7.4
349	+369	—13.0	350	+363	—12.0	354	+343	—8.5
359	+346	—13.0	0	+343	—12.0	4	+328	—8.5
9	+325	—11.4	10	+322	—10.6	14	+314	—7.4
19	+308	— 8.5	20	+308	— 7.8	24	+302	—5.5
29	+296	— 4.5	30	+296	— 4.2	34	+296	—2.9
39	+293	0.0	40	+293	0.0	44	+293	0.0
49	+296	+ 4.5	50	+296	+ 4.2	54	+296	+2.9
59	+308	+ 8.5	60	+308	+ 7.8	64	+302	+5.5
69	+325	+11.4	70	+322	+10.6	74	+314	+7.4
79	+346	+13.0	80	+343	+12.0	84	+328	+8.5
89	+369	+13.0	90	+363	+12.0	94	+343	+8.5
99	+390	+11.4	100	+381	+10.6	104	+354	+7.4
109	+407	+ 8.5	110	+398	+ 7.8	114	+366	+5.5
119	+417	+ 4.5	120	+407	+ 4.2	124	+375	+2.9
129	+422	0.0	130	+410	0.0	134	+376	0.0
139	+417	— 4.5	140	+407	— 4.2	144	+375	—2.9
149	+407	— 8.5	150	+398	— 7.8	154	+366	—5.5
159	+390	—11.4	160	+381	—10.6	164	+354	—7.4
169	+369	—13.0	170	+363	—12.0	174	+343	—8.5
179	+346	—13.0	180	+343	—12.0	184	+328	—8.5
189	+325	—11.4	190	+322	—10.6	194	+314	—7.4
199	+308	— 8.5	200	+308	— 7.8	204	+302	—5.5
209	+296	— 4.5	210	+296	— 4.2	214	+296	—2.9
219	+293	0.0	220	+293	0.0	224	+293	0.0
229	+296	+ 4.5	230	+296	+ 4.2	234	+296	+2.9
239	+308	+ 8.5	240	+308	+ 7.8	244	+302	+5.5
249	+325	+11.4	250	+322	+10.6	254	+314	+7.4
259	+346	+13.0	260	+343	+12.0	264	+328	+8.5
269	+369	+13.0	270	+363	+12.0	274	+343	+8.5
279	+390	+11.4	280	+381	+10.6	284	+354	+7.4
289	+407	+ 8.5	290	+398	+ 7.8	294	+366	+5.5
299	+417	+ 4.5	300	+407	+ 4.2	304	+375	+2.9

SPECIAL REFRACTION TABLES.—*Continued.*

Plate 23 West.			Plate 24 East.			Plate 24 West.		
$p.$	$\frac{\sigma-s}{s} \times 10^2.$	$\pi-p.$	$p.$	$\frac{\sigma-s}{s} \times 10^2.$	$\pi-p.$	$p.$	$\frac{\sigma-s}{s} \times 10^2.$	$\pi-p.$
315°	+369	0.0	304°	+771	0.0	304°	+730	0.0
325	+366	-2.7	314	+756	-16.8	314	+715	-15.5
335	+360	-5.1	324	+712	-31.5	324	+680	-29.1
345	+352	-6.8	334	+645	-42.4	334	+621	-39.1
355	+337	-7.8	344	+569	-48.3	344	+548	-44.5
5	+325	-7.8	354	+488	-48.3	354	+473	-44.5
15	+314	-6.8	4	+412	-42.4	4	+401	-39.1
25	+302	-5.1	14	+347	-31.5	14	+343	-29.1
35	+296	-2.7	24	+307	-16.8	24	+306	-15.5
45	+293	0.0	34	+292	0.0	34	+293	0.0
55	+296	+2.7	44	+307	+16.8	44	+306	+15.5
65	+302	+5.1	54	+347	+31.5	54	+343	+29.1
75	+314	+6.8	64	+412	+42.4	64	+401	+39.1
85	+325	+7.8	74	+488	+48.3	74	+473	+44.5
95	+337	+7.8	84	+569	+48.3	84	+548	+44.5
105	+352	+6.8	94	+645	+42.4	94	+621	+39.1
115	+360	+5.1	104	+712	+31.5	104	+680	+29.1
125	+366	+2.7	114	+756	+16.8	114	+715	+15.5
135	+369	0.0	124	+771	0.0	124	+730	0.0
145	+366	-2.7	134	+756	-16.8	134	+715	-15.5
155	+360	-5.1	144	+712	-31.5	144	+680	-29.1
165	+352	-6.8	154	+645	-42.4	154	+621	-39.1
175	+337	-7.8	164	+569	-48.3	164	+548	-44.5
185	+325	-7.8	174	+488	-48.3	174	+473	-44.5
195	+314	-6.8	184	+412	-42.4	184	+401	-39.1
205	+302	-5.1	194	+347	-31.5	194	+343	-29.1
215	+296	-2.7	204	+307	-16.8	204	+306	-15.5
225	+293	0.0	214	+292	0.0	214	+293	0.0
235	+296	+2.7	224	+307	+16.8	224	+306	+15.5
245	+302	+5.1	234	+347	+31.5	234	+343	+29.1
255	+314	+6.8	244	+412	+42.4	244	+401	+39.1
265	+325	+7.8	254	+488	+48.3	254	+473	+44.5
275	+337	+7.8	264	+569	+48.3	264	+548	+44.5
285	+352	+6.8	274	+645	+42.4	274	+621	+39.1
295	+360	+5.1	284	+712	+31.5	284	+680	+29.1
305	+366	+2.7	294	+756	+16.8	294	+715	+15.5

SPECIAL REFRACTION TABLES.—*Concluded.*

Plate 25 East.			Plate 25 West.		
$p$ .	$\frac{\sigma - s}{s} \times 10^3$ .	$\pi - p$ .	$p$ .	$\frac{\sigma - s}{s} \times 10^3$ .	$\pi - p$ .
305°	+ .529	0.0	306°	+ .512	0.0
315	+ .520	— 8.3	316	+ .503	— 7.6
325	+ .500	—15.6	326	+ .485	—14.3
335	+ .470	—21.0	336	+ .456	—19.3
345	+ .432	—23.8	346	+ .420	—22.0
355	+ .391	—23.8	356	+ .384	—22.0
5	+ .353	—21.0	6	+ .347	—19.3
15	+ .320	—15.6	16	+ .320	—14.3
25	+ .300	— 8.3	26	+ .300	— 7.6
35	+ .294	0.0	36	+ .294	0.0
45	+ .300	+ 8.3	46	+ .300	+ 7.6
55	+ .320	+15.6	56	+ .320	+14.3
65	+ .353	+21.0	66	+ .347	+19.3
75	+ .391	+23.8	76	+ .384	+22.0
85	+ .432	+23.8	86	+ .420	+22.0
95	+ .470	+21.0	96	+ .456	+19.3
105	+ .500	+15.6	106	+ .485	+14.3
115	+ .520	+ 8.3	116	+ .503	+ 7.6
125	+ .529	0.0	126	+ .512	0.0
135	+ .520	— 8.3	136	+ .503	— 7.6
145	+ .500	—15.6	146	+ .485	—14.3
155	+ .470	—21.0	156	+ .456	—19.3
165	+ .432	—23.8	166	+ .420	—22.0
175	+ .391	—23.8	176	+ .384	—22.0
185	+ .353	—21.0	186	+ .347	—19.3
195	+ .320	—15.6	196	+ .320	—14.3
205	+ .300	— 8.3	206	+ .300	— 7.6
215	+ .294	0.0	216	+ .294	0.0
225	+ .300	+ 8.3	226	+ .300	+ 7.6
235	+ .320	+15.6	236	+ .320	+14.3
245	+ .353	+21.0	246	+ .347	+19.3
255	+ .391	+23.8	256	+ .384	+22.0
265	+ .432	+23.8	266	+ .420	+22.0
275	+ .470	+21.0	276	+ .456	+19.3
285	+ .500	+15.6	286	+ .485	+14.3
295	+ .520	+ 8.3	296	+ .503	+ 7.6



## IV.

## CORRECTION FOR PRECESSION, NUTATION, AND ABERRATION.

PRECESSION and nutation affect all the position angles at the central star equally. For they change only the position of the celestial equator; and this changes nothing but the direction of the zero of position angles on the plate. They produce no effect whatever on the distances. Moreover, it has been shown by BESSEL\* that if a very small circle be supposed drawn upon the sky, the effect of aberration will be to transform it into another small circle, concentric with the first, but having a slightly different radius, and also slightly revolved about the common centre. It follows from this that the aberration correction of the position angles, like that for precession and nutation, is a constant for the whole plate; while the aberration correction of the distances is entirely independent of the direction in which they are measured. This makes the application of all these corrections a very simple matter. If we adopt the usual designations of the *American Ephemeris*, as well as the customary Besselian formulæ, we have for the position angles:

$$\begin{aligned} \alpha' &= 20''.06 \sin \alpha \sec \delta & \gamma' &= \cos \alpha \tan \delta \\ \beta' &= \cos \alpha \sec \delta & \delta' &= \sin \alpha \tan \delta \\ \Delta p &= -A\alpha' - B\beta' - C\gamma' - D\delta' \end{aligned}$$

which is additive to observed position angles. The annual increase of position angles is:

$$20''.06 \sin \alpha \sec \delta.$$

For the distances, the aberration correction is given by:

$$\begin{aligned} \gamma &= (\tan \epsilon \sin \delta + \sin \alpha \cos \delta) \sin \iota'' \\ \delta &= -\cos \alpha \cos \delta \sin \iota'' \\ \Delta s &= (C\gamma + D\delta)s \end{aligned}$$

\* Bessel, *Astronomische Untersuchungen*, vol. i, p. 207.

which is additive to observed distances. If we substitute in the above formulæ the co-ordinates of the central star 24 *p*; viz:

$$\alpha = 54^{\circ} 57' \quad \delta = +23^{\circ} 43'$$

we get the following expressions for the correction to reduce the observed values to 1873.0:—

For the position angles:

$$\begin{aligned} &+17''.9 + [n1.2536]A + [n9.7974]B + [n9.4020]C + [n9.5560]D, \text{ for plates} \\ &\hspace{15em} \text{taken in 1872.} \\ &\hspace{10em} + [n1.2536]A + [n9.7974]B + [n9.4020]C + [n9.5560]D, \text{ for plates} \\ &\hspace{15em} \text{taken in 1873.} \\ &-17''.9 + [n1.2536]A + [n9.7974]B + [n9.4020]C + [n9.5560]D, \text{ for plates} \\ &\hspace{15em} \text{taken in 1874.} \end{aligned}$$

For the distances:

$$s \{ [4.6513]C + [n4.4064]D \}, \text{ for all plates.}$$

If we apply these formulæ to the several plates we find the following values of the position angle corrections, and of the factor for correcting the distances:

Plate.	Position Angle Correction.	Distance Factor $\times 10^3$ .
16	+18.5	-.0769
17	+18.5	-.0769
18	+20.0	-.0918
19	-33.5	+.0217
20	-33.5	+.0217
21	-33.5	+.0217
22	-33.9	+.0130
23	-33.9	+.0130
24	-34.9	-.0111
25	-34.9	-.0111

The values are the same for Eastern and Western impressions. The distance corrections have been computed with CRELLE'S tables by simply multiplying the factor given above by the number of thousands in the distance *s*. The position angle corrections, being constant for the whole plate, have been incorporated with the "zero correction," as will be explained later (see VI.).

## V.

## SCALE VALUE.

IT is of course of the highest importance to obtain an accurate determination of the "scale value," or number of seconds of arc corresponding to one division of the measuring micrometer. The values of this quantity used in the present paper depend entirely upon a comparison with the Königsberg and Yale heliometer measures of the Pleiades. It is proper to call attention to the fact that the reduction of the other clusters measured by RUTHERFURD must be made with the scale values deduced here: and this is another reason for letting the reduction of the Pleiades precede that of the other clusters. Accordingly, six "standard stars" have been selected, and the scale value for each plate has been determined so as to make the sum of the six distances of these stars from 24 *p* equal to the sum of the same distances as furnished by the heliometer observations. For this purpose, the heliometer places have been interpolated to 1873.0 by means of the Yale and Königsberg measures, using the proper motions given by ELKIN.\* The conditions governing the selection of the standard stars have been the following:

- I. The stars must have been observed both at Yale and Königsberg.
- II. The magnitudes must be between 7.0 and 8.2, so as to be bright enough to be heliometrically well determined, and at the same time not so bright as to blur the photographic images.
- III. The stars must be symmetrically situated in position angle about 24 *p*. This will free the resulting scale value from the various errors depending on the direction of measurement. It will also remove the effect of such inaccuracy as may exist in the heliometer place of the central star 24 *p*.

\* Transactions of the Astr. Observatory of Yale University, vol. i, p. 99.

IV. The distances of the stars from 24 *p* must be large, but not large enough to bring them at all near the edges of the plate.

The following stars were selected in accordance with these conditions:

Star.	Heliometer Distance.	Mag.	Approximate Pos. Angle.
<i>Anon.</i> 20	1700.64	8.0	0.8
39	2895.67	7.7	61.4
34	2436.45	7.2	126.1
23	1578.34	8.0	176.5
1	1600.38	8.2	258.8
4	1618.07	8.1	298.6
	11830.55		

The distribution in position angle is such that

$$\Sigma (\sin p) = -0.10, \quad \Sigma (\cos p) = +0.18$$

The effect of any error in the heliometric place of 24 *p* upon the sum of the distances will therefore be quite inappreciable. Using then the above value (11830".55) as the true sum of the six distances, we find for the various plates the scale values contained in the following table. The value obtained for plate 21 depends upon five stars only, as *Anon.* 4 was lacking on that plate.

Plate.	Scale Value.
16 E.	28.0157
16 W.	28.0178
17 E.	28.0146
17 W.	28.0156
18 E.	28.0141
18 W.	28.0147
19 E.	28.0117
19 W.	28.0127
20 E.	28.0113
20 W.	28.0122
21 E.	28.0107
21 W.	28.0137
22 E.	28.0142
22 W.	28.0153
23 E.	28.0126
23 W.	28.0137
24 E.	28.0059
24 W.	28.0081
25 E.	28.0063
25 W.	28.0070



It is possible to make an approximate estimate of the probable errors of these scale values. According to ELKIN the probable errors of his final adjusted star places are  $\pm 0''.08$  for either co-ordinate, while those of the proper motions (Yale—Königsberg) are  $\pm 0''.20$ . But as we shall only use the proper motions during a period of twelve years (1885–1873), we can take  $\pm 0''.05$  as the probable error of a proper motion. The probable error of the sum of six heliometer distances, reduced to 1873.0, may therefore be estimated as

$$\pm \sqrt{6} [(.08)^2 + (.05)^2]^{\frac{1}{2}} = \pm 0''.23.$$

An examination of the RUTHERFURD observation books shows that the average probable error of a distance measure is  $\pm 0''.05$ , according to the inter-agreement of the separate settings. The sum of six distances will therefore have the probable error

$$\pm .05 \sqrt{6} = \pm 0''.15.$$

Since the number of thousands in the sum of the six distances is 11.8, the probable error of the scale value will be

$$\pm \frac{1}{11.8} [(.23)^2 + (.15)^2]^{\frac{1}{2}} = \pm 0''.02 \text{ per } 1000''.$$

This estimate of the probable error does not include the effect of systematic errors of measurement due to imperfections of the photographic images, or possible distortions of the film,\* or incorrect division errors. It will be noticed in the table that the scale values for the Western impressions exhibit a very small but well-marked excess over those for the Eastern impressions. This may best be explained as a result of the methods used in measuring the plates; but the discussion of this and several other important points must form a part of the description of the measuring micrometer soon to be issued. There does not appear to be any marked connection between the scale values and the readings of the thermometer or focal micrometer, as given in the table at the end of I.

\* In the American Journal of Science and Arts, vol. iv, Dec. 1872, RUTHERFURD showed that the distortion of his films during development was inappreciable.

## VI.

## ZERO CORRECTIONS.

THE first correction required by the position angles given in the observation books is one of  $+ 270^\circ$ . This makes them agree with the usual method of counting position angles *from the North point towards the East*. The correction is of course due to the use of the last impression of the central star as a starting point for position angle measurements on the plate. The further correction is then as follows:\*

Let  $v$  = the correction which must be added to all the observed position angles of any plate.

$x$  = precession to reduce position angles to 1873.0 (See IV.).

$y$  = refraction ( $\pi - p$ ) for position angle  $270^\circ$  (See tables at end of III.).

$k$  = approximate scale value in seconds of arc =  $28''.01$ .

$z$  = distance of last impression of the central star (See table at end of I.).

$\delta$  = declination of central star.

Then

$$v = \frac{1}{2} k z \tan \delta - y + x.$$

The following table contains the zero corrections computed by this formula for the various plates:†

\* For a demonstration of the formula here given, see *Astronomical Journal*, 1891, No. 17, p. 131.

† It is perhaps worth while to note that these zero corrections do not include a certain special correction required by the position angles derived from the Western impressions. This special correction, which will be fully explained later (see VII.), might have been included in the zero corrections for the Western impressions, as it is a constant for each plate. But I have preferred to apply it directly to the final results, as will be seen in the next section.

TABLE OF ZERO CORRECTIONS IN POSITION ANGLE.

Plate.	Correction.
16 East	+9' 42''
16 West	+9 43
17 East	+9 47
17 West	+9 48
18 East	+7 53
18 West	+7 54
19 East	+4 40
19 West	+4 43
20 East	+6 32
20 West	+6 34
21 East	+7 31
21 West	+7 32
22 East	+6 46
22 West	+6 47
23 East	+6 50
23 West	+6 51
24 East	+6 13
24 West	+6 16
25 East	+8 15
25 West	+8 16

## EMPIRICAL CORRECTIONS.

When we compare the various values of any position angle with the mean of all, we find that certain systematic errors seem to attach to each plate. For instance, all the position angles of some particular plate will exceed their mean values. This can only be ascribed to a systematic error in the zero reading of that plate. In fact, it would be perfectly proper to subtract from all the angles of any plate a constant quantity equal to the mean of the excesses of the various angles of that plate over their respective mean values. We might even derive such a correction from a selected number of special stars whose magnitudes were such as to ensure good photographic images.\* But I have preferred not to do this for the following reasons:

Let  $n$  = number of plates.

$s$  = number of stars on each plate.

\* This process was employed by GOULD. *Memoirs of the National Academy*, vol. iv, third memoir, p. 184, and fourth memoir, p. 194.

$p_1, p_1', p_1'', \dots p_1^n$  = the position angle of the first star on the various plates.

$p_2, p_2', p_2'', \dots p_2^n$  = the same for the next star, and so on.

And put :

$$P_1 = \frac{1}{n} (p_1 + p_1' + \dots + p_1^n)$$

$$P_2 = \frac{1}{n} (p_2 + p_2' + \dots + p_2^n)$$

. . . . .

Then  $P_1, P_2, \dots$  are the mean values of position angles which we obtain if we apply *no* systematic corrections. The correction for the first plate will be :

$$- \frac{(p_1 - P_1) + (p_2 - P_2) + \dots + (p_s - P_s)}{s}$$

and for the second plate :

$$- \frac{(p_1' - P_1) + (p_2' - P_2) + \dots + (p_s' - P_s)}{s}$$

and so on for the other plates. Now if we introduce into these last expressions the values given above for  $P_1, P_2, \dots P_s$ , we find that *the sum of all the corrections is zero*. It is therefore obvious that if we were to apply the corrections, we would get for the mean values of the position angles,  $P_1, P_2, \dots P_s$  as before. Thus the final values are not changed by the proposed process.\* But the inter-agreement of the separate values of any position angle might be very much improved by applying the corrections. This arises from the fact that the uncorrected position angles involve the error made in observing the star, as well as that belonging to the zero point, while a portion of the latter error would be practically removed by applying the corrections. If we compute the probable errors in the usual way, we shall get larger values than would result if the corrections were introduced. Investigation shows, however, that their introduction would diminish the probable errors by less than one-fifth; so that we are justified in omitting them altogether.

\* The sum of the corrections applied by GOULD in his reduction (already referred to) of the Præsepe plates is exactly zero. In the case of the Pleiades plates, the sum is  $-10''$  for the Eastern impressions, but for the Western it is  $-1' 31''$ . This last may be due to a typographical error.



In the case of the distances it is also possible to deduce a systematic correction for each plate. But the result upon the mean of the measures is *nil*, as before. Let  $x$  and  $y$  be the coördinates of the central star in a system whose origin is at the *corrected position* of the same, and whose axes of  $X$  and  $Y$  are directed toward the North and East. Then each measured distance requires the correction

$$x \cos p + y \sin p.$$

If we let  $\sigma_0$  be the mean from all the plates of a measured distance  $\sigma$ , and put

$$d = \sigma_0 - \sigma,$$

then every star on the plate yields an equation of the form

$$x \cos p + y \sin p = d$$

for determining  $x$  and  $y$ . Forming normal equations, and solving, we get:

$$x = \frac{[\sin^2 p] [d \cos p] - \frac{1}{2} [\sin 2p] [d \sin p]}{-\frac{1}{4} [\sin 2p]^2 + [\sin^2 p] [\cos^2 p]}$$

$$y = \frac{\frac{1}{2} [\sin 2p] [d \cos p] - [\cos^2 p] [d \sin p]}{-[\sin^2 p] [\cos^2 p] + \frac{1}{4} [\sin 2p]^2}$$

Now if we put:

$[D]$  = the sum of all the values of  $d$  for any particular star from all the plates, we shall have

$$[D] = [\sigma_0 - \sigma] = 0,$$

consequently

$$[d \cos p] = [D] \cos p = 0$$

$$[d \sin p] = [D] \sin p = 0,$$

and therefore

$$[x] = 0$$

$$[y] = 0.$$

The sum of all the systematic corrections for any particular star is then also zero: for

$$[x \cos p + y \sin p] = [x] \cos p + [y] \sin p = 0$$

Consequently the *mean* of all the measured values of  $\sigma$  would not be changed by the application of the corrections.

## VII.

## RESULTS OF THE MEASURES.

THE results of the several measures have been arranged in tabular form at the end of the present section. The first column of the tables gives the number of the plate; the second contains the distance, expressed in divisions of the glass scale of the micrometer. This quantity is given exactly as found in the observation books, before the application of any corrections whatever. The following column gives the distance, still in terms of the micrometer scale, but corrected for runs and division errors, according to section II. It is thus always possible to see the precise effect of the division error corrections and runs upon the result of the observation. The fourth column contains the final corrected distance in seconds of arc. This quantity is obtained from the preceding column by using the scale values given in Section V., and applying corrections for refraction (Section III.) and aberration (Section IV.). Moreover, the distances on the plate are really the *tangents* of the angular distances of the stars in the sky, and it has therefore been necessary to apply a further correction of\*

$$- \frac{1}{3} s^3 \sin^2 i''.$$

This quantity has been taken, without interpolation, from the following table:

\* See Astronomical Journal, No. 233, p. 131.

TABLE OF THE TANGENT CORRECTION.

Dist.	Corr.	Dist.	Corr.
"	"	2919	"
0	— .00	2969	— .20
861	— .01	3016	— .21
1242	— .02	3062	— .22
1472	— .03	3107	— .23
1647	— .04	3151	— .24
1791	— .05	3193	— .25
1914	— .06	3233	— .26
2024	— .07	3274	— .27
2123	— .08	3313	— .28
2214	— .09	3352	— .29
2297	— .10	3389	— .30
2375	— .11	3426	— .31
2448	— .12	3461	— .32
2517	— .13	3496	— .33
2583	— .14	3531	— .34
2644	— .15	3565	— .35
2705	— .16	3598	— .36
2762	— .17	3631	— .37
2816	— .18	3663	— .38
2869	— .19	3694	— .39
2919			

The fifth column contains the position angle, exactly as given in the observation books, where it is referred to the last image of the central star as a zero point. The sixth column gives the final corrected value of the position angle. This is obtained from the previous column by applying first a correction of  $+270^\circ$ , so that the angles may be counted in the usual way from the north point towards the point of greatest right ascension. The remaining corrections are the *zero correction* (Section VI.), and the *refraction correction* (Section III.). In addition to these, the *Western* impressions need a further correction which is not necessary for the Eastern impressions. When the plates were measured, the Eastern impression of the central star was centred upon the position circle of the micrometer. The impressions were then separately measured, using both the longitudinal motion of the micrometer, and that at right angles to it. It follows that the position angles for the Western impressions have all been referred to the same zero as those of the Eastern impressions. They must therefore all be corrected by the amount that position angle  $270^\circ$  changes when the point at which it is measured moves along the trail a distance equal to the distance between the two impressions of the central star. In

other words, if we imagine a line drawn upon the plate from the Eastern impression of the central star, in the direction of position angle  $270^\circ$ , then another line, drawn parallel to the first through the Western impression of the central star, will *not* be directed towards position angle  $270^\circ$ , but will make a small angle with that direction. All the Western position angles of any plate will need to be corrected by the amount of this angle. The correction, in seconds of arc, is\*

$$-d \tan \delta,$$

where  $d$  is the distance of the two impressions of the central star, in seconds of arc, and  $\delta$  the declination of the central star. In this way the corrections required by the *Western* position angles upon the several plates have been found to be:

Plate.	Correction.
16	—17''
17	—19
18	—25
19	—31
20	—39
21	—39
22	—44
23	—42
24	—33
25	—56
Mean	—34.5

It is perhaps of interest to compare the Eastern position angles with the Western, before the above correction has been applied. This has been done for the following nine stars, which happened to be the first ones finally reduced. After applying all the other corrections, the direct differences (East *minus* West) were taken for each star. The mean for each star from all the plates is given here.

\* This correction is of the same form as that given in *Astronomical Journal*, No. 233, p. 130, Eq. (7).



Star.	E. — W.
<i>Pleione</i>	—30"
<i>Atlas</i>	—40
<i>Merope</i>	—32
<i>Asterope</i>	—30
<i>Maia</i>	—20
<i>Anon. I</i>	—30
<i>Taygeta</i>	—50
<i>Electra</i>	—26
<i>Celæno</i>	—40
Mean	—33"

The close agreement of this mean with that found above, affords a striking confirmation of the necessity of the correction just discussed, nor does it seem necessary to compare further the Eastern and Western impressions. The omission of the correction would result in making the final adopted mean position angles of *all* stars observed on the ten plates too great by 17". If the distance between the two impressions of the central star were quite large, the effect might be greatly increased.

The tables also give at the foot the final adopted means of the distances and position angles, together with their probable errors as derived from the internal agreement of the separate values. These probable errors have been computed from the sums of the residuals, not the sums of squares. For the position angles, the probable error is first given in seconds, and followed by the equivalent displacement in arc of a great circle, corresponding to the distance of the star. The final means will be assembled in another table in the next section.

## 1.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	111.3272	111.3382	3119.73	16° 42' 53"	286° 52' 26"
16 West	111.3232	111.3343	3119.88	16 42 54	286 52 9
17 East	111.3416	111.3526	3120.11	16 43 22	286 52 53
17 West	111.3348	111.3460	3120.04	16 44 5	286 53 17
18 East	111.3568	111.3678	3120.25	16 45 47	286 53 39
18 West	111.3505	111.3589	3120.08	16 45 58	286 53 26
19 East	111.2970	111.3079	3119.86	16 49 8	286 54 14
19 West	111.3223	111.3316	3120.55	16 49 36	286 54 11
20 East	111.3334	111.3444	3120.39	16 46 40	286 53 29
20 West	111.3291	111.3381	3120.26	16 47 8	286 53 18
21 East	111.3184	111.3294	3119.63	16 46 1	286 53 44
21 West	111.3235	111.3325	3120.01	16 46 27	286 53 31
22 East	111.3418	111.3528	3120.52	16 46 57	286 53 52
22 West	111.3208	111.3308	3119.99	16 47 35	286 53 47
23 East	111.3174	111.3284	3119.52	16 46 36	286 53 33
23 West	111.3151	111.3251	3119.52	16 46 43	286 52 59
24 East	111.3360	111.3470	3120.37	16 47 22	286 54 3
24 West	111.3270	111.3346	3120.15	16 47 58	286 54 6
25 East	111.3632	111.3742	3120.47	16 45 2	286 53 31
25 West	111.3564	111.3675	3120.32	16 45 31	286 53 5
Means		3120.08	±0.05	286° 53' 28"	±5" (±0.07)

## 2.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	123.0285	123.0392	3447.79	330° 11' 8"	240° 20' 46"
16 West	123.0308	123.0398	3448.09	330 11 15	240 20 37
17 East	123.0284	123.0390	3447.86	330 11 36	240 21 19
17 West	123.0265	123.0355	3447.93	330 12 0	240 21 25
18 East	123.0587	123.0695	3448.12	330 14 38	240 22 28
18 West	123.0541	123.0605	3447.95	330 14 48	240 22 14
19 East	123.0581	123.0689	3448.40	330 16 55	240 22 10
19 West	123.0569	123.0605	3448.26	330 18 0	240 22 44
20 East	123.0924	123.1032	3449.19	330 14 58	240 21 51
20 West	123.0790	123.0827	3448.72	330 15 22	240 21 36
21 East	123.0647	123.0736	3448.22	330 14 3	240 21 47
21 West	123.0472	123.0509	3447.94	330 14 31	240 21 36
22 East	123.0640	123.0748	3448.63	330 15 3	240 21 58
22 West	123.0707	123.0745	3448.75	330 15 6	240 21 17
23 East	123.0488	123.0595	3447.97	330 14 41	240 21 36
23 West	123.0452	123.0490	3447.81	330 15 10	240 21 23
24 East	123.0837	123.0945	3448.35	330 15 53	240 22 44
24 West	123.0973	123.1010	3448.77	330 17 4	240 23 22
25 East	123.0899	123.1007	3448.40	330 12 55	240 21 28
25 West	123.0649	123.0676	3447.54	330 13 49	240 21 25
Means		3448.23	±0.07	240° 21' 48"	±6" (±0.10)

## 3.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	113.0906	113.1001	3169.04	29° 24' 18"	299° 33' 53"
16 West	113.0784	113.0888	3168.98	29 24 13	299 33 31
17 East	113.1058	113.1153	3169.41	29 24 15	299 33 50
17 West	113.0921	113.1025	3169.16	29 25 7	299 34 23
18 East	113.1038	113.1148	3169.19	29 26 50	299 34 44
18 West	113.1091	113.1187	3169.39	29 27 33	299 35 3
19 East	113.0570	113.0679	3169.32	29 30 20	299 35 8
19 West	113.0694	113.0797	3169.65	29 30 43	299 35 2
20 East	113.0749	113.0859	3169.27	29 28 7	299 34 45
20 West	113.0756	113.0860	3169.30	29 28 26	299 34 26
21 East	113.0895	113.1005	3169.30	29 27 15	299 34 50
21 West	113.0757	113.0861	3169.20	29 27 18	299 34 15
22 East	113.0833	113.0943	3169.36	29 27 55	299 34 45
22 West	113.0890	113.0983	3169.56	29 29 3	299 35 10
24 East	113.0986	113.1096	3169.87	29 29 0	299 35 21
24 West	113.0914	113.1018	3169.78	29 29 22	299 35 12
25 East	113.1058	113.1168	3169.35	29 26 40	299 35 0
25 West	113.0871	113.0974	3168.84	29 27 5	299 34 30
Means		3169.33 ±0.04		299° 34' 39" ±5" (±0.07)	

## 4.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	86.7118	86.7244	2430.19	0° 44' 16"	270° 53' 48"
16 West	86.7152	86.7270	2430.47	0 44 15	270 53 30
17 East	86.7038	86.7163	2429.99	0 45 10	270 54 41
17 West	86.7189	86.7298	2430.46	0 45 33	270 54 45
18 East	86.7411	86.7537	2430.71	0 47 6	270 54 57
18 West	86.7407	86.7521	2430.74	0 47 43	270 55 9
21 East	86.7041	86.7166	2429.91	0 46 42	270 54 30
21 West	86.7168	86.7293	2430.50	0 47 8	270 54 17
23 East	86.7075	86.7201	2429.99	0 47 43	270 54 41
23 West	86.7307	86.7421	2430.70	0 48 43	270 55 00
25 East	86.7627	86.7754	2431.23	0 46 53	270 55 30
25 West	86.7468	86.7579	2430.75	0 46 45	270 54 26
Means		2430.47 ±0.08		270° 54' 36" ±6" (±0.07)	

## 5.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	92.7347	92.7489	2598.91	22° 2' 28"	292° 12' 3"
16 West	92.7375	92.7509	2599.15	22 2 32	292 11 49
17 East	92.7423	92.7565	2599.08	22 2 33	292 12 5
17 West	92.7400	92.7522	2599.05	22 3 20	292 12 33
18 East	92.7488	92.7630	2599.05	22 5 24	292 13 17
18 West	92.7529	92.7655	2599.18	22 5 31	292 13 00
19 East	92.7061	92.7202	2599.01	22 8 32	292 13 30
19 West	92.7000	92.7126	2598.79	22 8 55	292 13 24
20 East	92.7247	92.7389	2599.07	22 5 56	292 12 40
20 West	92.7146	92.7257	2598.74	22 6 40	292 12 46
21 East	92.7273	92.7415	2598.86	22 5 3	292 12 43
21 West	92.7190	92.7317	2598.82	22 5 48	292 12 49
22 East	92.7340	92.7482	2599.23	22 6 18	292 13 11
22 West	92.7355	92.7479	2599.29	22 6 15	292 12 25
23 East	92.7193	92.7335	2598.55	22 5 37	292 12 33
23 West	92.7228	92.7352	2598.67	22 6 28	292 12 43
24 East	92.7201	92.7343	2598.88	22 7 3	292 13 36
24 West	92.7456	92.7568	2599.61	22 7 15	292 13 16
25 East	92.7416	92.7558	2598.92	22 4 55	292 13 20
25 West	92.9413	92.7537	2598.87	22 5 13	292 12 43
Means		2598.99	±0.04	292° 12' 50"	±5" (±0.06)

## 6.

## CELÉNO.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	77.8507	77.8639	2181.87	15° 54' 53"	286° 4' 25"
16 West	77.8423	77.8535	2181.76	15 55 36	286 4 51
17 East	77.8502	77.8635	2181.84	15 55 30	286 5 1
17 West	77.8433	77.8545	2181.67	15 56 18	286 5 30
18 East	77.8490	77.8607	2181.56	15 58 31	286 6 23
18 West	77.8491	77.8598	2181.58	15 58 55	286 6 23
19 East	77.8235	77.8367	2181.80	16 1 53	286 6 59
19 West	77.8137	77.8239	2181.44	16 2 15	286 6 51
20 East	77.8313	77.8445	2181.65	15 59 3	286 5 52
20 West	77.8241	77.8359	2181.44	15 59 45	286 5 56
21 East	77.8388	77.8521	2181.64	15 58 22	286 6 5
21 West	77.8349	77.8461	2181.66	15 59 8	286 6 12
22 East	77.8489	77.8606	2182.04	15 59 33	286 6 28
22 West	77.8401	77.8513	2181.83	16 0 23	286 6 35
23 East	77.8417	77.8549	2181.65	15 59 10	286 6 7
23 West	77.8413	77.8519	2181.64	15 59 35	286 5 51
24 East	77.8291	77.8408	2181.47	16 0 10	286 6 52
24 West	77.8314	77.8416	2181.59	16 1 1	286 7 10
25 East	77.8602	77.8719	2181.90	15 57 38	286 6 8
25 West	77.8424	77.8538	2181.42	15 58 24	286 5 58
Means		2181.67	±0.03	286° 6' 5"	±6" (±0.06)



7.

## ELECTRA.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	72.5551	72.5679	2033. <sup>''</sup> 51	359° 0' 13''	269° 9' 45''
16 West	72.5284	72.5405	2032.91	359 1 3	269 10 18
17 East	72.5562	72.5691	2033.58	359 0 33	269 10 4
17 West	72.5437	72.5544	2033.25	359 0 25	269 9 37
18 East	72.5611	72.5740	2033.43	359 3 25	269 11 16
18 West	72.5667	72.5779	2033.59	359 3 50	269 11 16
19 East	72.5245	72.5372	2033.04	359 7 1	269 12 23
19 West	72.5238	72.5346	2032.99	359 7 53	269 12 44
20 East	72.5399	72.5527	2033.22	359 4 37	269 11 35
20 West	72.5277	72.5394	2032.87	359 5 4	269 11 23
21 East	72.5428	72.5556	2033.12	359 4 15	269 12 3
21 West	72.5328	72.5455	2033.03	359 4 45	269 11 54
22 East	72.5383	72.5511	2033.17	359 5 11	269 12 10
22 West	72.5324	72.5441	2033.03	359 5 21	269 11 36
23 East	72.5402	72.5529	2033.03	359 4 45	269 11 43
23 West	72.5308	72.5424	2032.81	359 5 1	269 11 18
24 East	72.5410	72.5538	2033.08	359 5 50	269 12 48
24 West	72.5375	72.5477	2033.02	359 6 1	269 12 26
25 East	72.5464	72.5593	2032.94	359 2 51	269 11 29
25 West	72.5421	72.5527	2032.76	359 3 38	269 11 19
Means		2033. <sup>''</sup> 12	±0.04	269° 11' 28''	±8'' (±0.08)

8.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	131.2746	131.2786	3678. <sup>''</sup> 62	303° 18' 55''	213° 28' 43''
16 West	131.2990	131.2990	3679.48	303 19 40	213 29 24
17 East	131.2838	131.2879	3678.92	303 18 46	213 28 44
17 West	131.3011	131.3011	3679.46	303 19 37	213 29 18
18 East	131.2878	131.2918	3678.47	303 22 26	213 30 18
18 West	131.3113	131.3138	3679.19	303 23 8	213 30 36
Means		3679. <sup>''</sup> 02		213° 29' 31''	

## 9.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	68.3248	68.3366	1914.90	15° 22' 46"	285° 32' 18"
16 West	68.3129	68.3267	1914.79	15 22 45	285 32 0
17 East	68.3261	68.3379	1914.92	15 23 26	285 32 57
17 West	68.3256	68.3394	1915.03	15 23 32	285 32 43
18 East	68.3337	68.3455	1914.95	15 25 46	285 33 38
18 West	68.3345	68.3445	1914.97	15 26 11	285 33 39
19 East	68.3200	68.3318	1915.37	15 28 28	285 33 36
19 West	68.3015	68.3123	1914.83	15 29 20	285 33 57
20 East	68.3097	68.3215	1914.77	15 26 18	285 33 8
20 West	68.3130	68.3238	1914.87	15 26 28	285 32 39
21 East	68.3232	68.3350	1914.93	15 25 27	285 33 10
21 West	68.3205	68.3313	1915.02	15 25 33	285 32 38
22 East	68.3337	68.3455	1915.35	15 26 23	285 33 19
22 West	68.3163	68.3281	1914.94	15 26 23	285 32 35
23 East	68.3268	68.3386	1914.98	15 26 3	285 33 0
23 West	68.3152	68.3270	1914.73	15 26 48	285 33 4
24 East	68.3262	68.3380	1915.15	15 27 28	285 34 10
24 West	68.3407	68.3507	1915.60	15 27 20	285 33 30
25 East	68.3443	68.3561	1915.28	15 24 43	285 33 13
25 West	68.3397	68.3511	1915.16	15 25 6	285 32 41
Means		1915.03	±0.04	285° 33' 6"	±5" (±0.05)

## 10.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	85.0357	85.0480	2383.32	320° 39' 37"	230° 49' 19"
16 West	85.0412	85.0519	2383.63	320 39 26	230 48 52
17 East	85.0282	85.0404	2383.18	320 39 13	230 49 2
17 West	85.0303	85.0416	2383.32	320 39 48	230 49 19
18 East	85.0639	85.0763	2383.76	320 43 10	230 51 0
18 West	85.0466	85.0578	2383.30	320 42 42	230 50 8
19 East	85.0449	85.0572	2383.30	320 44 28	230 49 32
19 West	85.0527	85.0634	2383.57	320 45 43	230 50 17
20 East	85.0649	85.0773	2383.79	320 42 26	230 49 12
20 West	85.0628	85.0727	2383.75	320 43 3	230 48 53
22 East	85.0640	85.0764	2383.98	320 43 10	230 50 1
22 West	85.0461	85.0558	2383.49	320 43 32	230 49 39
23 East	85.0479	85.0603	2383.38	320 42 27	230 49 19
23 West	85.0550	85.0648	2383.59	320 43 55	230 50 6
24 East	85.0880	85.1004	2383.98	320 43 38	230 50 18
24 West	85.0857	85.0964	2384.04	320 44 55	230 50 27
25 East	85.0716	85.0840	2383.49	320 42 3	230 50 30
25 West	85.0756	85.0864	2383.62	320 42 46	230 50 17
Means		2383.58	±0.04	230° 49' 47"	±6" (±0.07)

11.

18 m.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	112.7614	112.7732	3159 <sup>''</sup> .86	54° 44' 30''	324° 54' 14''
16 West	112.7654	112.7752	3160.15	54 44 57	324 54 25
17 East	112.7688	112.7806	3159.95	54 45 0	324 54 48
17 West	112.7608	112.7719	3159.61	54 45 50	324 55 20
18 East	112.7810	112.7928	3160.21	54 48 7	324 56 3
18 West	112.7764	112.7857	3160.08	54 48 1	324 55 33
19 East	112.7156	112.7273	3159.61	54 52 13	324 56 23
19 West	112.7280	112.7376	3159.91	54 52 45	324 56 30
20 East	112.7352	112.7470	3159.68	54 49 18	324 55 32
20 West	112.7376	112.7471	3159.73	54 50 3	324 55 41
21 East	112.7440	112.7558	3159.60	54 48 15	324 55 35
21 West	112.7544	112.7640	3160.12	54 48 40	324 55 23
22 East	112.7447	112.7565	3159.87	54 48 46	324 55 25
22 West	112.7465	112.7565	3159.96	54 49 48	324 55 45
23 East	112.7582	112.7700	3159.95	54 48 52	324 55 39
23 West	112.7503	112.7603	3159.79	54 49 40	324 55 46
24 East	112.7517	112.7635	3159.98	54 50 15	324 55 56
24 West	112.7501	112.7597	3160.03	54 50 42	324 55 55
25 East	112.7612	112.7730	3159.65	54. 47 12	324 55 12
25 West	112.7609	112.7705	3159.62	54 48 20	324 55 27
Means		3159 <sup>''</sup> .87	±0 <sup>''</sup> .03	324° 55' 32''	±5'' (±0 <sup>''</sup> .07)

12.

TAYGETA.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	77.2300	77.2417	2164 <sup>''</sup> .38	35° 0' 5''	305° 9' 42''
16 West	77.2181	77.2300	2164.21	35 0 56	305 10 16
17 East	77.2351	77.2468	2164.46	35 1 13	305 10 50
17 West	77.2205	77.2324	2164 13	35 1 50	305 11 8
18 East	77.2402	77.2520	2164.50	35 3 18	305 11 13
18 West	77.2371	77.2479	2164.43	35 4 18	305 11 48
19 East	77.1999	77.2131	2164.40	35 7 55	305 12 33
19 West	77.1916	77.2016	2164.08	35 8 5	305 12 16
20 East	77.2169	77.2286	2164.45	35 4 58	305 11 30
20 West	77.2013	77.2123	2164.01	35 5 1	305 10 56
21 East	77.2220	77.2336	2164.34	35 3 47	305 11 19
21 West	77.2115	77.2225	2164.22	35 4 30	305 11 24
22 East	77.2213	77.2329	2164.47	35 4 40	305 11 28
22 West	77.2240	77.2356	2164.61	35 6 20	305 12 25
23 East	77.2355	77.2473	2164.65	35 4 55	305 11 48
23 West	77.2287	77.2388	2164.48	35 5 36	305 11 48
24 East	77.2191	77.2321	2164.52	35 6 5	305 12 16
24 West	77.2088	77.2198	2164.24	35 6 53	305 12 34
25 East	77.2407	77.2525	2164.60	35 2 58	305 11 13
25 West	77.2167	77.2274	2163.91	35 4 8	305 11 29
Means		2164 <sup>''</sup> .35	±0 <sup>''</sup> .03	305° 11' 30''	±6'' (±0 <sup>''</sup> .07)

## 13.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	118.8946	118.9082	3331".74	59° 48' 22"	329° 58' 8"
16 West	118.9171	118.9287	3332.56	59 48 28	329 57 58
17 East	118.8992	118.9111	3331.69	59 48 48	329 58 39
17 West	118.9120	118.9236	3332.16	59 49 10	329 58 43
22 East	118.8965	118.9084	3332.23	59 52 53	329 59 30
22 West	118.9035	118.9132	3332.47	59 52 31	329 58 26
	Means		3332".14	329° 58' 34"	

## 14.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	130.5456	130.5499	3658".17	295° 34' 58"	205° 44' 48"
16 West	130.5845	130.5868	3659.50	295 35 6	205 44 41
17 East	130.5423	130.5466	3658.11	295 34 52	205 44 53
17 West	130.5544	130.5567	3658.55	295 35 30	205 45 14
18 East	130.5540	130.5582	3657.94	295 37 42	205 45 35
18 West	130.5654	130.5701	3658.36	295 38 50	205 46 19
22 East	130.5721	130.5764	3658.77	295 38 47	205 45 27
22 West	130.5866	130.5873	3659.21	295 39 50	205 45 47
	Means		3658".58	205° 45' 21"	

## 15.

## ANONYMA I.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	57.0918	57.1010	1600".16	348° 46' 53"	258° 56' 26"
16 West	57.0932	57.1023	1600.32	348 47 30	258 56 47
17 East	57.0905	57.1008	1600.18	348 47 50	258 57 24
17 West	57.0880	57.0970	1600.15	348 47 3	258 56 18
18 East	57.1101	57.1203	1600.48	348 50 0	258 57 50
18 West	57.1076	57.1161	1600.40	348 50 50	258 58 16
19 East	57.0927	57.1029	1600.36	348 51 56	258 57 20
19 West	57.0950	57.1033	1600.39	348 52 36	258 57 29



## 15.—Continued.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
20 East	57.0982	57.1084	1600.36	348 49 30	258 56 30
20 West	57.0902	57.0979	1600.09	348 50 5	258 56 26
21 East	57.0989	57.1092	1600.27	348 49 32	258 57 21
21 West	57.0971	57.1048	1600.29	348 50 6	258 57 16
22 East	57.0934	57.1037	1600.25	348 49 58	258 56 57
22 West	57.1060	57.1147	1600.62	348 51 33	258 57 48
23 East	57.1066	57.1158	1600.46	348 50 20	258 57 18
23 West	57.1014	57.1101	1600.36	348 50 13	258 56 29
24 East	57.1020	57.1122	1600.27	348 51 14	258 58 15
24 West	57.1053	57.1136	1600.41	348 51 20	258 57 47
25 East	57.1094	57.1197	1600.31	348 48 51	258 57 30
25 West	57.1153	57.1244	1600.46	348 49 48	258 57 30
Means		1600.33	$\pm 0.02$	258° 57' 15"	$\pm 6'' (\pm 0.04)$

## 16.

## ANONYMA 2.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	68.4973	68.5095	1919.70	39° 53' 25"	310° 3' 4"
16 West	68.4863	68.4999	1919.57	39 53 50	310 3 12
17 East	68.4932	68.5054	1919.53	39 53 58	310 3 38
17 West	68.4913	68.5055	1919.59	39 54 57	310 4 17
18 East	68.4981	68.5103	1919.59	39 56 45	310 4 40
18 West	68.5006	68.5131	1919.71	39 57 12	310 4 43
19 East	68.4610	68.4732	1919.40	40 0 13	310 4 44
19 West	68.4539	68.4642	1919.15	40 0 18	310 4 21
20 East	68.4740	68.4862	1919.42	39 57 48	310 4 15
20 West	68.4546	68.4658	1918.88	39 58 8	310 3 59
21 East	68.4725	68.4846	1919.17	39 56 48	310 4 17
21 West	68.4736	68.4839	1919.32	39 57 0	310 3 51
22 East	68.4795	68.4917	1919.51	39 57 51	310 4 37
22 West	68.4976	68.5074	1920.01	39 58 26	310 4 29
23 East	68.4733	68.4855	1919.13	39 57 18	310 4 9
23 West	68.4814	68.4918	1919.37	39 57 53	310 4 3
24 East	68.4709	68.4830	1919.30	39 59 16	310 5 19
24 West	68.4946	68.5050	1919.99	39 58 35	310 4 9
25 East	68.4871	68.4993	1919.34	39 55 23	310 3 34
25 West	68.4790	68.4898	1919.09	39 57 21	310 4 38
Means		1919.44	$\pm 0.05$	310° 4' 12"	$\pm 5'' (\pm 0.05)$

## 17.

## ANONYMA 4.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	57.7338	57.7446	1618.10	28° 29' 46"	298° 39' 21"
16 West	57.7184	57.7279	1617.76	28 29 46	298 39 4
17 East	57.7321	57.7429	1618.02	28 30 0	298 39 34
17 West	57.7421	57.7507	1618.29	28 30 11	298 39 26
18 East	57.7398	57.7506	1618.13	28 33 25	298 41 19
18 West	57.7372	57.7458	1618.03	28 32 16	298 39 45
19 East	57.7090	57.7197	1618.00	28 35 43	298 40 32
19 West	57.7137	57.7224	1618.07	28 35 48	298 40 8
20 East	57.7219	57.7327	1618.08	28 32 55	298 39 33
20 West	57.7145	57.7223	1617.80	28 33 51	298 39 52
22 East	57.7197	57.7305	1617.94	28 33 45	298 40 36
22 West	57.7147	57.7238	1617.80	28 33 51	298 39 59
23 East	57.7305	57.7413	1618.08	28 32 10	298 39 4
23 West	57.7328	57.7421	1618.15	28 33 45	298 39 58
24 East	57.7188	57.7296	1617.97	28 34 8	298 40 30
24 West	57.7225	57.7312	1618.06	28 34 16	298 40 8
25 East	57.7361	57.7469	1618.08	28 31 40	298 40 0
25 West	57.7307	57.7405	1617.91	28 32 18	298 39 44
	Means	1618.02	±0.02	298° 39' 55"	±5" (±0.04)

## 18.

## ANONYMA 5.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	82.0254	82.0394	2298.02	52° 26' 20"	322° 36' 3"
16 West	82.0180	82.0316	2298.74	52 25 50	322 35 17
17 East	82.0260	82.0399	2298.71	52 26 8	322 35 54
17 West	82.0413	82.0546	2299.20	52 27 1	322 36 29
	Means	2298.67		322° 35' 56"	

19.

ANONYMA 6.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	53.4492	53.4597	1498.02	23° 46' 8"	293° 55' 42"
16 West	53.4440	53.4547	1498.00	23 46 10	293 55 27
17 East	53.4549	53.4654	1498.16	23 47 25	293 56 57
17 West	53.4314	53.4420	1497.56	23 46 58	293 56 11
18 East	53.4533	53.4637	1498.00	23 49 10	293 57 3
18 West	53.4632	53.4714	1498.25	23 49 10	293 56 39
20 East	53.4252	53.4356	1497.62	23 48 18	293 55 1
20 West	53.4322	53.4391	1497.73	23 48 58	293 55 3
22 East	53.4384	53.4489	1497.93	23 48 8	293 55 1
22 West	53.4308	53.4402	1497.73	23 49 25	293 55 35
23 East	53.4227	53.4331	1497.34	23 49 18	293 56 14
23 West	53.4315	53.4409	1497.60	23 49 2	293 55 16
25 East	53.4567	53.4672	1498.14	23 46 2	293 54 26
25 West	53.4641	53.4735	1498.33	23 47 51	293 55 20
Means		1497.89	±0.06	293° 55' 43"	±9" (±0.06)

20.

MAIA.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	55.1074	55.1163	1544.43	35° 8' 41"	305° 18' 18"
16 West	55.0784	55.0880	1543.75	35 9 35	305. 18 55
17 East	55.0896	55.0996	1543.93	35 10 18	305 19 55
17 West	55.0745	55.0841	1543.54	35 10 43	305 20 1
18 East	55.0836	55.0936	1543.67	35 12 13	305 20 8
18 West	55.0923	55.1019	1543.94	35 12 0	305 19 30
19 East	55.0721	55.0821	1544.05	35 17 45	305 22 23
19 West	55.0668	55.0753	1543.87	35 17 40	305 21 51
20 East	55.0790	55.0890	1543.97	35 13 56	305 20 28
20 West	55.0629	55.0713	1543.50	35 15 8	305 21 . 3
21 East	55.0696	55.0796	1543.53	35 13 53	305 21 25
21 West	55.0746	55.0830	1543.76	35 13 58	305 20 52
22 East	55.0880	55.0980	1544.16	35 14 27	305 21 15
22 West	55.0887	55.0971	1544.18	35 14 16	305 20 21
23 East	55.0898	55.0998	1544.05	35 14 31	305 21 24
23 West	55.0778	55.0862	1543.71	35 14 56	305 21 8
24 East	55.0757	55.0857	1543.86	35 15 57	302 22 8
24 West	55.0819	55.0903	1544.05	35 16 11	305 21 52
25 East	55.0864	55.0964	1543.81	35 13 22	305 21 37
25 West	55.0746	55.0816	1543.41	35 13 39	305 21 0
Means		1543.86	±0.04	305° 20' 47"	±10" (±0.07)

## 21.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	132.4486	132.4514	3711.39	289° 13' 43"	199° 23' 34"
16 West	132.4486	132.4514	3711.68	289 13 48	199 23 24
17 East	132.4412	132.4440	3711.19	289 14 5	199 24 7
17 West	132.4528	132.4531	3711.60	289 14 33	199 24 19
18 East	132.4758	132.4786	3711.73	289 17 30	199 25 23
18 West	132.4540	132.4543	3711.14	289 17 37	199 25 7
19 East	132.4753	132.4781	3711.79	289 20 48	199 25 6
19 West	132.4901	132.4906	3712.26	289 21 18	199 25 10
20 East	132.4794	132.4823	3711.82	289 17 55	199 24 12
20 West	132.4816	132.4845	3712.00	289 18 20	199 24 1
22 East	132.4611	132.4640	3711.66	289 18 18	199 24 56
22 West	132.4668	132.4697	3711.97	289 19 8	199 25 3
24 East	132.4822	132.4851	3711.13	289 19 31	199 25 20
24 West	132.4969	132.4974	3711.76	289 19 48	199 25 9
25 East	132.4996	132.5013	3711.59	289 16 8	199 24 10
25 West	132.4985	132.4990	3711.62	289 16 50	199 23 58
Means		3711.65	±0.05	199° 24' 33"	±8" (±0.13)

## 22.

## ANONYMA 7.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	44.7874	44.7995	1255.44	346° 27' 7"	256° 36' 41"
16 West	44.8029	44.8132	1255.94	346 27 28	256 36 45
17 East	44.7896	44.8018	1255.53	346 27 23	256 36 58
17 West	44.7827	44.7929	1255.33	346 28 53	256 38 9
18 East	44.7960	44.8082	1255.50	346 30 5	256 37 55
18 West	44.8013	44.8121	1255.65	346 30 53	256 38 19
19 East	44.7919	44.8040	1255.65	346 32 4	256 37 28
19 West	44.8011	44.8099	1255.86	346 32 20	256 37 13
20 East	44.7963	44.8084	1255.67	346 29 43	256 36 43
20 West	44.7940	44.8044	1255.58	346 29 56	256 36 17
21 East	44.8015	44.8137	1255.72	346 28 53	256 36 42
21 West	44.8001	44.8104	1255.76	346 29 7	256 36 16
22 East	44.8043	44.8164	1255.93	346 30 10	256 37 9
22 West	44.8116	44.8201	1256.07	346 31 20	256 37 34
23 East	44.8017	44.8139	1255.76	346 31 10	256 38 8
23 West	44.8064	44.8171	1255.90	346 31 6	256 37 22
24 East	44.8035	44.8157	1255.72	346 31 2	256 38 3
24 West	44.8180	44.8269	1256.10	346 31 10	256 37 37
25 East	44.8193	44.8303	1256.01	346 28 10	256 36 49
25 West	44.8106	44.8187	1255.70	346 29 28	256 37 10
Means		1255.74	±0.03	256° 37' 16"	±6" (±0.04)



23.

21 *k*, ASTEROPE.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	70.3710	70.3828	1972.19	52° 24' 2"	322° 33' 45"
16 West	70.3688	70.3800	1972.26	52 24 2	322 33 29
17 East	70.3634	70.3752	1971.91	52 24 11	322 33 57
17 West	70.3671	70.3796	1972.09	52 24 50	322 34 18
18 East	70.3744	70.3862	1972.15	52 27 16	322 35 12
18 West	70.3626	70.3755	1971.89	52 27 38	322 35 10
19 East	70.3383	70.3500	1971.94	52 30 56	322 35 10
19 West	70.3351	70.3465	1971.84	52 31 25	322 35 13
20 East	70.3505	70.3622	1971.96	52 28 3	322 34 19
20 West	70.3546	70.3652	1972.08	52 28 13	322 33 54
21 East	70.3585	70.3702	1971.98	52 27 23	322 34 44
21 West	70.3564	70.3670	1972.08	52 27 30	322 34 15
22 East	70.3589	70.3706	1972.17	52 28 8	322 34 48
22 West	70.3528	70.3634	1972.02	52 28 48	322 34 46
23 East	70.3633	70.3750	1972.09	52 27 12	322 34 0
23 West	70.3578	70.3684	1971.97	52 28 28	322 34 35
24 East	70.3510	70.3627	1971.91	52 30 14	322 35 58
24 West	70.3500	70.3614	1971.96	52 30 13	322 35 29
25 East	70.3721	70.3840	1972.10	52 26 55	322 34 56
25 West	70.3728	70.3811	1972.05	52 27 40	322 34 48
Means		1972.03	±0.02	322° 34' 39"	±6" (±0.06)

24.

22 *l*.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	65.1849	65.1945	1826.82	53° 28' 13"	323° 37' 56"
16 West	65.1698	65.1792	1826.53	53 28 15	323 37 42
17 East	65.1846	65.1942	1826.74	53 28 30	323 38 17
17 West	65.1762	65.1860	1826.58	53 30 1	323 39 30
18 East	65.1809	65.1915	1826.61	53 30 48	323 38 44
18 West	65.1751	65.1854	1826.48	53 32 26	323 39 58
19 East	65.1565	65.1661	1826.64	53 35 35	323 39 47
19 West	65.1461	65.1564	1826.36	53 36 15	323 40 1
20 East	65.1535	65.1631	1826.27	53 32 58	323 39 13
20 West	65.1611	65.1705	1826.49	53 33 45	323 39 25
21 East	65.1623	65.1719	1826.32	53 31 55	323 39 16
21 West	65.1649	65.1747	1826.57	53 32 32	323 39 16
22 East	65.1661	65.1757	1826.57	53 31 53	323 38 33
22 West	65.1660	65.1746	1826.59	53 33 23	323 39 21
23 East	65.1704	65.1800	1826.52	53 31 58	323 38 45
23 West	65.1634	65.1720	1826.35	53 32 55	323 39 2
24 East	65.1548	65.1654	1826.26	53 33 52	323 39 34
24 West	65.1715	65.1809	1826.76	53 34 0	323 39 15
25 East	65.1792	65.1888	1826.55	53 31 13	323 39 13
25 West	65.1821	65.1907	1826.62	53 31 53	323 39 0
Means		1826.53	±0.02	323° 39' 6"	±6" (±0.05)

## 25.

## ANONYMA 8.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	34.3838	34.3949	963. <sup>82</sup>	16° 27' 18"	286° 36' 51"
16 West	34.3845	34.3958	963.92	16 27 57	286 37 12
17 East	34.3956	34.4068	964.14	16 28 2	286 37 33
17 West	34.3981	34.4083	964.22	16 27 41	286 36 53
18 East	34.3991	34.4103	964.15	16 28 58	286 36 50
18 West	34.3945	34.4041	963.99	16 30 3	286 37 31
19 East	34.3769	34.3880	963.93	16 32 0	286 37 6
19 West	34.3604	34.3706	963.44	16 32 5	286 36 41
20 East	34.3918	34.4029	964.18	16 28 55	286 35 44
20 West	34.3813	34.3903	963.85	16 30 23	286 36 34
21 East	34.3841	34.3953	963.88	16 29 0	286 36 43
21 West	34.3877	34.3968	964.00	16 29 21	286 36 25
22 East	34.3833	34.3944	963.91	16 30 23	286 37 18
22 West	34.3785	34.3885	963.78	16 30 30	286 36 42
23 East	34.3779	34.3890	963.66	16 29 56	286 36 53
23 West	34.3924	34.4025	964.08	16 29 59	286 36 15
24 East	34.3873	34.3984	964.03	16 31 18	286 37 59
24 West	34.3852	34.3951	963.98	16 33 15	286 39 24
25 East	34.4129	34.4241	964.55	16 29 54	286 38 24
25 West	34.3749	34.3846	963.46	16 30 2	286 37 36
Means		963.95	±0.04	286° 37' 8"	±7" (±0.04)

## 26.

## ANONYMA 9.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	33.0912	33.1012	927. <sup>57</sup>	15° 50' 41"	286° 0' 13"
16 West	33.1294	33.1403	928.75	15 49 48	285 59 3
17 East	33.1379	33.1481	928.88	15 51 3	286 0 34
17 West	33.1387	33.1496	928.95	15 51 16	286 0 28
18 East	33.1433	33.1553	928.98	15 51 48	285 59 40
18 West	33.1345	33.1443	928.70	15 54 8	286 1 36
19 East	33.1244	33.1363	928.85	15 54 58	286 0 5
19 West	33.1206	33.1300	928.67	15 54 42	285 59 19
20 East	33.1363	33.1464	928.97	15 51 55	285 58 45
20 West	33.1239	33.1327	928.61	15 52 23	285 58 34
21 East	33.1304	33.1424	928.79	15 52 13	285 59 56
21 West	33.1419	33.1508	929.08	15 52 31	285 59 35
22 East	33.1354	33.1473	928.96	15 52 35	285 59 30
22 West	33.1310	33.1408	928.80	15 52 21	285 58 33
23 East	33.1357	33.1458	928.83	15 52 34	285 59 31
23 West	33.1344	33.1443	928.82	15 53 11	285 59 27
24 East	33.1247	33.1366	928.67	15 53 5	285 59 47
24 West	33.1350	33.1445	928.94	15 52 59	285 59 8
25 East	33.1471	33.1591	929.11	15 51 38	286 0 8
25 West	33.1281	33.1374	928.51	15 52 26	286 0 0
Means		928.77	±0.04	285° 59' 42"	±7" (±0.04)

27.

## MEROPE.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	36.9986	37.0107	1037 <sup>''</sup> .20	323° 32' 28 <sup>''</sup>	233° 42' 9 <sup>''</sup>
16 West	37.0043	37.0143	1037.39	323 32 13	233 41 38
17 East	37.0052	37.0173	1037.41	323 33 21	233 43 8
17 West	36.9951	37.0051	1037.12	323 33 36	233 43 5
18 East	37.0017	37.0138	1037.13	323 35 31	233 43 21
18 West	37.0046	37.0146	1037.18	323 36 32	233 43 58
19 East	36.9837	36.9958	1036.67	323 39 21	233 44 29
19 West	36.9906	36.9990	1036.80	323 40 10	233 44 48
20 East	36.9915	37.0036	1036.86	323 36 55	233 43 44
20 West	36.9815	36.9907	1036.53	323 37 23	233 43 33
21 East	36.9766	36.9886	1036.41	323 36 0	233 43 41
21 West	36.9738	36.9830	1036.35	323 36 36	233 43 38
22 East	36.9861	36.9982	1036.79	323 36 11	233 43 3
22 West	36.9771	36.9870	1036.52	323 38 27	233 44 35
23 East	36.9824	36.9945	1036.63	323 37 0	233 43 53
23 West	36.9791	36.9882	1036.49	323 36 31	233 42 42
24 East	36.9854	36.9975	1036.49	323 38 58	233 45 42
24 West	36.9867	36.9951	1036.50	323 39 0	233 45 11
25 East	36.9916	37.0037	1036.64	323 35 50	233 44 19
25 West	36.9889	36.9987	1036.53	323 36 21	233 43 54
Means		1036 <sup>''</sup> .78	±0.06	233° 43' 44 <sup>''</sup>	±9 <sup>''</sup> (±0.06)

28.

## ANONYMA 10.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	31.7296	31.7424	889 <sup>''</sup> .48	33° 24' 53 <sup>''</sup>	303° 34' 29 <sup>''</sup>
16 West	31.7169	31.7299	889.20	33 24 53	303 34 13
17 East	31.7444	31.7572	889.87	33 26 32	303 36 8
17 West	31.7342	31.7455	889.57	33 26 20	303 35 37
18 East	31.7335	31.7463	889.52	33 26 54	303 34 48
18 West	31.7388	31.7484	889.60	33 27 10	303 34 40
19 East	31.7173	31.7300	889.46	33 29 56	303 34 38
19 West	31.7126	31.7225	889.25	33 31 1	303 35 14
20 East	31.7239	31.7366	889.49	33 27 48	303 34 22
20 West	31.7210	31.7297	889.31	33 28 8	303 34 5
21 East	31.7314	31.7442	889.60	33 27 1	303 34 34
21 West	31.7204	31.7291	889.26	33 27 0	303 33 55
22 East	31.7240	31.7368	889.45	33 27 41	303 34 30
22 West	31.7254	31.7356	889.45	33 29 15	303 35 21
23 East	31.7344	31.7472	889.65	33 27 28	303 34 21
23 West	31.7336	31.7424	889.55	33 28 13	303 34 25
24 East	31.7193	31.7320	889.35	33 29 33	303 35 47
24 West	31.7297	31.7400	889.61	33 29 6	303 34 50
25 East	31.7369	31.7497	889.64	33 26 23	303 34 39
25 West	31.7239	31.7341	889.21	33 26 54	303 34 16
Means		889 <sup>''</sup> .48	±0.03	303° 34' 45 <sup>''</sup>	±5 <sup>''</sup> (±0.03)

## 29.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	67.2474	67.2578	1884.77	289° 9' 7"	199° 18' 58"
16 West	67.2431	67.2546	1884.83	289 9 21	199 18 57
17 East	67.2436	67.2539	1884.66	289 9 2	199 19 4
17 West	67.2446	67.2561	1884.81	289 9 35	199 19 21
18 East	67.2588	67.2692	1884.87	289 12 43	199 20 36
18 West	67.2529	67.2636	1884.77	289 12 30	199 20 0
19 East	67.2624	67.2728	1885.01	289 16 3	199 20 21
19 West	67.2628	67.2735	1885.09	289 16 50	199 20 42
20 East	67.2664	67.2768	1885.08	289 12 51	199 19 8
20 West	67.2627	67.2741	1885.06	289 14 13	199 19 54
21 East	67.2559	67.2663	1884.74	289 11 58	199 19 19
21 West	67.2616	67.2730	1885.12	289 13 20	199 20 3
22 East	67.2622	67.2726	1885.13	289 14 8	199 20 46
22 West	67.2614	67.2734	1885.23	289 15 10	199 21 5
23 East	67.2495	67.2599	1884.67	289 12 49	199 19 33
23 West	67.2506	67.2620	1884.81	289 13 36	199 19 39
24 East	67.2689	67.2793	1884.76	289 14 38	199 20 27
24 West	67.2740	67.2848	1885.05	289 16 55	199 22 16
25 East	67.2807	67.2912	1885.09	289 11 50	199 19 52
25 West	67.2772	67.2892	1885.09	289 12 22	199 19 30
Means		1884.93	±0.03	199° 19' 59"	±8" (±0.07)

## 30.

## ANONYMA II.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	20.4379	20.4468	572.99	354° 34' 37"	264° 44' 9"
16 West	20.4345	20.4441	572.96	354 35 30	264 44 45
17 East	20.4424	20.4512	573.11	354 34 52	264 44 50
17 West	20.4427	20.4515	573.15	354 35 46	264 44 59
18 East	20.4487	20.4576	573.21	354 36 28	264 44 18
18 West	20.4476	20.4557	573.18	354 37 32	264 44 58
19 East	20.4348	20.4436	572.97	354 37 33	264 42 57
19 West	20.4352	20.4433	572.97	354 37 7	264 42 00
21 East	20.4360	20.4449	572.91	354 36 15	264 44 4
21 West	20.4469	20.4559	573.27	354 35 17	264 42 27
22 East	20.4519	20.4607	573.41	354 34 45	264 41 44
22 West	20.4414	20.4506	573.14	354 36 36	264 42 51
23 East	20.4402	20.4491	573.02	354 35 38	264 42 36
23 West	20.4365	20.4465	572.98	354 36 7	264 42 24
25 East	20.4525	20.4613	573.28	354 36 7	264 44 46
25 West	20.4320	20.4404	572.70	354 31 6	264 38 48
Means		573.08	±0.03	264° 43' 17"	±13" (±0.03)



31.

ANONYMA 12.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	52.9476	52.9587	1484.00	77° 42' 20"	347° 52' 11"
16 West	52.9458	52.9561	1484.04	77 42 32	347 52 7
17 East	52.9506	52.9616	1484.02	77 42 39	347 52 38
17 West	52.9468	52.9570	1483.97	77 43 18	347 53 0
18 East	52.9510	52.9620	1483.98	77 45 45	347 53 41
18 West	52.9532	52.9635	1484.06	77 46 30	347 54 2
19 East	52.9331	52.9441	1483.80	77 49 53	347 53 49
19 West	52.9287	52.9389	1483.69	77 50 16	347 53 47
20 East	52.9410	52.9520	1483.90	77 47 33	347 53 37
20 W	52.9392	52.9494	1483.85	77 47 30	347 52 59
21 East	52.9428	52.9538	1483.85	77 46 25	347 53 38
21 West	52.9412	52.9514	1483.85	77 46 18	347 52 54
22 East	52.9453	52.9564	1484.07	77 46 43	347 53 16
22 West	52.9352	52.9454	1483.81	77 47 21	347 53 12
23 East	52.9452	52.9562	1483.95	77 46 19	347 53 1
23 West	52.9423	52.9525	1483.91	77 46 43	347 52 45
24 East	52.9470	52.9580	1483.88	77 49 8	347 54 33
24 West	52.9490	52.9593	1484.01	77 49 2	347 54 1
25 East	52.9451	52.9562	1483.68	77 45 43	347 53 34
25 West	52.9514	52.9612	1483.84	77 46 2	347 53 0
Means		1483.91	±0.02	347° 53' 17"	±6" (±0.04)

32.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	90.7812	90.7960	2544.22	83° 48' 55"	353° 58' 47"
16 West	90.7773	90.7917	2544.29	83 48 51	353 58 27
17 East	90.7847	90.7994	2544.24	83 49 10	353 59 12
17 West	90.7804	90.7950	2544.21	83 49 15	353 59 0
18 East	90.7949	90.8096	2544.40	83 52 1	353 59 57
18 West	90.7865	90.8010	2544.22	83 52 38	354 0 10
19 East	90.7656	90.7802	2544.02	83 56 50	354 0 46
19 West	90.7613	90.7758	2543.95	83 57 36	354 1 7
20 East	90.7580	90.7726	2543.61	83 53 25	353 59 29
20 West	90.7631	90.7763	2543.78	83 54 34	354 0 3
21 East	90.7749	90.7895	2543.91	83 52 58	354 0 11
21 West	90.7673	90.7818	2543.98	83 53 25	354 0 1
22 East	90.7652	90.7798	2543.93	83 53 47	354 0 20
22 West	90.7730	90.7875	2544.24	83 54 5	353 59 56
23 East	90.7765	90.7912	2544.07	83 53 35	354 0 17
23 West	90.7667	90.7799	2543.85	83 53 35	353 59 36
24 East	90.7776	90.7922	2543.80	83 55 48	354 1 13
24 West	90.7833	90.7978	2544.12	83 55 3	354 0 2
25 East	90.7765	90.7912	2543.57	83 51 28	353 59 19
25 West	90.7960	90.8092	2544.13	83 52 33	353 59 31
Means		2544.03	±0.04	353° 59' 52"	±7" (±0.08)

## 33.

## ANONYMA 13.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	17.5704	17.5779	492.61	297° 5' 41"	207° 15' 30"
16 West	17.5701	17.5773	492.64	297 5 30	207 15 4
17 East	17.5904	17.5979	493.17	297 4 16	207 14 16
17 West	17.5880	17.5952	493.12	297 6 30	207 16 14
18 East	17.5920	17.5995	493.16	297 10 31	207 18 23
18 West	17.5880	17.5964	493.08	297 10 31	207 18 0
19 East	17.6014	17.6089	493.41	297 11 53	207 16 22
19 West	17.5915	17.6004	493.19	297 13 26	207 17 28
20 East	17.5938	17.6013	493.19	297 7 15	207 13 39
20 West	17.5918	17.5996	493.16	297 8 23	207 14 11
21 East	17.5971	17.6046	493.27	297 9 33	207 16 58
21 West	17.6021	17.6099	493.47	297 10 16	207 17 3
22 East	17.6035	17.6110	493.52	297 10 50	207 17 31
22 West	17.5985	17.6051	493.37	297 11 38	207 17 36
23 East	17.5953	17.6028	493.27	297 8 26	207 15 11
23 West	17.6105	17.6172	493.68	297 10 9	207 16 13
24 East	17.5991	17.6066	493.23	297 9 21	207 15 22
24 West	17.5953	17.6037	493.19	297 12 16	207 17 48
25 East	17.5991	17.6066	493.24	297 7 15	207 15 23
25 West	17.6077	17.6147	493.48	297 8 26	207 15 39
Means		493.22	±0.03	207° 16' 12"	±14" (±0.03)

## 34.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	21.3060	21.3149	597.28	74° 36' 8"	344° 45' 58"
16 West	21.3066	21.3167	597.38	74 36 41	344 46 15
17 East	21.3069	21.3158	597.27	74 38 14	344 48 12
17 West	21.2921	21.3021	596.93	74 38 38	344 48 19
18 East	21.3109	21.3198	597.30	74 40 33	344 48 29
18 West	21.2982	21.3073	597.04	74 41 48	344 49 21
19 East	21.2891	21.2981	596.93	74 44 48	344 48 44
19 West	21.2771	21.2861	596.60	74 45 51	344 49 22
20 East	21.2930	21.3019	596.97	74 43 51	344 49 55
20 West	21.2943	21.3022	596.99	74 43 38	344 49 8
21 East	21.2881	21.2969	596.79	74 41 41	344 48 54
21 West	21.2856	21.2947	596.78	74 41 22	344 47 59
22 East	21.2938	21.3026	597.01	74 40 3	344 46 37
22 West	21.2916	21.3008	596.97	74 39 53	344 45 45
23 East	21.2824	21.2913	596.65	74 40 7	344 46 50
23 West	21.3017	21.3110	597.22	74 40 23	344 46 25
25 East	21.3004	21.3092	597.04	74 38 30	344 46 21
25 West	21.3040	21 3137	597.17	74 37 15	344 44 13
Means		597.02	±0.04	344° 47' 36"	±17" (±0.04)

35.

ANONYMA 14.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	43.4149	43.4267	1216.95	276° 11' 43"	186° 21' 35"
16 West	43.4140	43.4269	1217.05	276 12 25	186 22 2
17 East	43.4242	43.4360	1217.19	276 11 53	186 21 57
17 West	43.4158	43.4287	1217.03	276 11 22	186 21 9
18 East	43.4260	43.4378	1217.15	276 15 50	186 23 45
18 West	43.4369	43.4498	1217.49	276 16 48	186 24 19
20 East	43.4361	43.4479	1217.48	276 15 18	186 21 26
20 West	43.4271	43.4400	1217.29	276 17 38	186 23 11
22 East	43.4363	43.4481	1217.57	276 17 40	186 24 14
22 West	43.4236	43.4365	1217.29	276 18 10	186 24 2
23 East	43.4283	43.4401	1217.27	276 14 10	186 20 52
23 West	43.4342	43.4471	1217.52	276 16 45	186 22 46
25 East	43.4645	43.4764	1218.02	276 14 13	186 22 8
25 West	43.4430	43.4544	1217.42	276 15 48	186 22 49
Means		1217.34	±0.05	186° 22' 36"	±14" (±0.07)

36.

ANONYMA 15.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc		
16 East	2.6706	2.6730	74.89	34° 45' 0"	304° 54' 37"
16 West	2.6791	2.6817	75.15	34 38 19	304 47 39
17 East	2.6798	2.6822	75.15	34 44 41	304 54 18
17 West	2.6957	2.6969	75.57	34 46 59	304 56 17
18 East	2.6904	2.6929	75.45	34 49 54	304 57 49
18 West	2.6850	2.6854	75.24	34 43 30	304 51 0
19 East	2.6785	2.6809	75.16	34 47 43	304 52 23
19 West	2.6728	2.6736	74.95	34 36 48	304 41 0
20 East	2.6727	2.6751	74.97	34 24 53	304 31 26
20 West	2.6824	2.6824	75.19	34 28 58	304 34 54
21 East	2.6635	2.6659	74.71	34 37 51	304 45 23
21 West	2.6735	2.6735	74.93	34 32 54	304 39 48
22 East	2.6782	2.6806	75.13	34 26 21	304 33 9
22 West	2.6826	2.6842	75.23	34 14 44	304 20 49
23 East	2.6716	2.6740	74.94	34 44 26	304 51 19
23 West	2.6721	2.6721	74.89	34 39 30	304 45 42
24 East	2.6832	2.6856	75.28	34 20 21	304 26 33
24 West	2.6980	2.6988	75.65	34 16 10	304 21 53
25 East	2.6684	2.6708	74.84	34 36 14	304 44 29
25 West	2.6710	2.6714	74.86	34 22 17	304 29 38
Means		75.11	±0.04	304° 42' 1"	±119" (±0.06)

## 37.

## ANONYMA 17.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	50.1446	50.1541	1405.43	271° 4' 40"	181° 14' 32"
16 West	50.1409	50.1504	1405.45	271 5 25	181 15 2
17 East	50.1472	50.1567	1405.49	271 4 20	181 14 23
17 West	50.1500	50.1594	1405.61	271 5 13	181 15 0
18 East	50.1514	50.1623	1405.55	271 8 20	181 16 15
18 West	50.1470	50.1580	1405.46	271 8 8	181 15 40
19 East	50.1588	50.1683	1405.89	271 12 53	181 16 52
19 West	50.1435	50.1530	1405.49	271 12 30	181 16 4
20 East	50.1562	50.1657	1405.74	271 9 50	181 15 56
20 West	50.1504	50.1598	1405.60	271 10 51	181 16 22
21 East	50.1497	50.1592	1405.49	271 8 48	181 16 2
21 West	50.1502	50.1597	1405.64	271 10 0	181 16 37
22 East	50.1501	50.1596	1405.66	271 10 31	181 17 4
22 West	50.1469	50.1563	1405.62	271 10 42	181 16 33
23 East	50.1457	50.1552	1405.44	271 8 55	181 15 37
23 West	50.1473	50.1566	1405.54	271 10 15	181 16 16
24 East	50.1437	50.1546	1405.20	271 11 45	181 17 14
24 West	50.1453	50.1563	1405.34	271 12 26	181 17 28
25 East	50.1569	50.1679	1405.50	271 8 50	181 16 43
25 West	50.1577	50.1672	1405.50	271 8 26	181 15 25
Means		1405.53	±0.02	181° 16' 4" ±8" (±0.05)	

## 38.

## ANONYMA 18.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	3.0594	3.0613	85.79	73° 35' 19"	343° 45' 9"
16 West	3.0543	3.0563	85.65	73 41 24	343 50 58
17 East	3.0598	3.0617	85.79	73 33 57	343 43 55
17 West	3.0522	3.0541	85.58	73 35 48	343 45 29
18 East	3.0489	3.0508	85.48	73 41 55	343 49 51
18 West	3.0556	3.0576	85.67	73 42 15	343 49 48
19 East	3.0458	3.0477	85.42	73 37 31	343 41 27
19 West	3.0387	3.0405	85.21	73 30 28	343 33 59
20 East	3.0448	3.0466	85.37	73 27 32	343 33 37
20 West	3.0518	3.0521	85.54	73 35 18	343 40 48
21 East	3.0385	3.0402	85.19	73 34 57	343 42 10
21 West	3.0444	3.0459	85.36	73 34 32	343 41 9
22 East	3.0420	3.0438	85.30	73 18 25	343 24 59
22 West	3.0487	3.0503	85.49	73 24 26	343 30 18
23 East	3.0488	3.0506	85.49	73 27 41	343 34 24
23 West	3.0450	3.0465	85.37	73 41 32	343 47 34
24 East	3.0541	3.0559	85.63	73 29 1	343 34 26
24 West	3.0439	3.0455	85.34	73 28 39	343 33 38
25 East	3.0499	3.0518	85.51	73 27 28	343 35 20
25 West	3.0463	3.0477	85.40	73 26 50	343 33 49
Means		85.48	±0.03	343° 39' 39" ±75" (±0.03)	



## 40.

## ANONYMA 19.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale	Arc.		
16 East	40.1924	40.2033	1126.60	269° 13' 8"	179° 23' 0"
16 West	40.2013	40.2122	1126.93	269 14 25	179 24 2
17 East	40.2024	40.2133	1126.86	269 13 57	179 24 0
17 West	40.1919	40.2028	1126.60	269 13 53	179 23 39
18 East	40.1986	40.2095	1126.68	269 18 20	179 26 15
18 West	40.1910	40.2032	1126.53	269 17 18	179 24 50
19 East	40.2054	40.2164	1127.03	269 20 50	179 24 48
19 West	40.1985	40.2095	1126.86	269 21 33	179 25 7
20 East	40.2048	40.2157	1126.93	269 17 40	179 23 46
20 West	40.1973	40.2082	1126.75	269 18 34	179 24 5
21 East	40.1978	40.2088	1126.69	269 17 31	179 24 27
21 West	40.2015	40.2125	1126.90	269 17 40	179 24 17
22 East	40.2046	40.2156	1127.00	269 18 53	179 25 26
22 West	40.1975	40.2085	1126.84	269 18 51	179 24 42
23 East	40.1884	40.1993	1126.46	269 16 9	179 22 51
23 West	40.1933	40.2042	1126.65	269 17 25	179 23 26
24 East	40.2091	40.2200	1126.89	269 19 23	179 24 51
24 West	40.1969	40.2091	1126.64	269 20 30	179 25 31
25 East	40.2095	40.2204	1126.82	269 16 16	179 24 8
25 West	40.2044	40.2167	1126.75	269 16 51	179 23 50
Means		1126.77	±0.03	179° 24' 21" ±8" (±0.04)	

## 41.

## ANONYMA 20.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	60.6775	60.6883	1700.63	90° 34' 58"	0° 44' 50"
16 West	60.6664	60.6749	1700.39	90 34 18	0 43 55
17 East	60.6634	60.6742	1700.20	90 34 51	0 44 54
17 West	60.6598	60.6706	1700.17	90 35 1	0 44 47
18 East	60.6764	60.6872	1700.45	90 38 5	0 46 0
18 West	60.6798	60.6906	1700.59	90 38 29	0 46 1
19 East	60.6574	60.6682	1700.13	90 42 3	0 46 2
19 West	60.6539	60.6647	1700.07	90 41 59	0 45 33
20 East	60.6670	60.6778	1700.30	90 39 0	0 45 6
20 West	60.6682	60.6790	1700.37	90 39 33	0 45 4
21 East	60.6642	60.6750	1700.14	90 38 21	0 45 35
21 West	60.6586	60.6694	1700.15	90 38 43	0 45 20
22 East	60.6598	60.6706	1700.21	90 39 15	0 45 48
22 West	60.6619	60.6720	1700.31	90 39 31	0 45 22
23 East	60.6685	60.6793	1700.33	90 38 15	0 44 57
23 West	60.6665	60.6773	1700.33	90 39 1	0 45 2
24 East	60.6781	60.6889	1700.33	90 40 53	0 46 22
24 West	60.6665	60.6773	1700.12	90 40 43	0 45 45
25 East	60.6829	60.6937	1700.38	90 37 23	0 45 16
25 West	60.6704	60.6812	1700.06	90 38 10	0 45 9
Means		1700.28	±0.03	0° 45' 21" ±5" (±0.04)	

## 42.

## ANONYMA 22.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	25.9510	25.9617	727.52	265° 31' 47"	175° 41' 39"
16 West	25.9527	25.9634	727.62	265 32 53	175 42 30
17 East	25.9499	25.9605	727.46	265 31 15	175 41 17
17 West	25.9497	25.9616	727.51	265 32 4	175 41 49
18 East	25.9632	25.9739	727.79	265 36 16	175 44 12
18 West	25.9632	25.9751	727.84	265 35 20	175 42 52
19 East	25.9655	25.9762	727.98	265 40 5	175 44 1
19 West	25.9596	25.9703	727.84	265 40 43	175 44 15
20 East	25.9643	25.9750	727.90	265 37 6	175 43 11
20 West	25.9621	25.9728	727.86	265 36 47	175 42 17
21 East	25.9558	25.9665	727.62	265 35 53	175 43 6
21 West	25.9546	25.9653	727.67	265 35 33	175 42 9
22 East	25.9588	25.9695	727.79	265 37 12	175 43 45
22 West	25.9624	25.9731	727.92	265 37 58	175 43 49
23 East	25.9579	25.9686	727.71	265 36 28	175 43 10
23 West	25.9489	25.9596	727.49	265 36 0	175 42 1
24 East	25.9609	25.9716	727.70	265 37 23	175 42 49
24 West	25.9587	25.9694	727.67	265 39 31	175 44 30
25 East	25.9681	25.9788	727.84	265 34 31	175 42 22
25 West	25.9657	25.9765	727.79	265 35 56	175 42 54
Means		727.73	±0.03	175° 42' 56"	±9" (±0.04)

## 43.

## ANONYMA 21.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale	Arc.		
16 East	69.5398	69.5536	1949.05	91° 27' 59"	1° 37' 51"
16 West	69.5299	69.5438	1948.93	91 28 4	1 37 41
17 East	69.5489	69.5639	1949.30	91 28 30	1 38 33
17 West	69.5306	69.5446	1948.84	91 28 32	1 38 19
18 East	69.5477	69.5616	1949.09	91 31 51	1 39 46
18 West	69.5325	69.5464	1948.72	91 31 57	1 39 29
19 East	69.5317	69.5456	1948.88	91 35 40	1 39 39
19 West	69.5337	69.5476	1948.98	91 35 40	1 39 15
20 East	69.5261	69.5399	1948.61	91 32 1	1 38 7
20 West	69.5391	69.5530	1949.01	91 33 1	1 38 32
21 East	69.5441	69.5573	1949.00	91 31 45	1 38 59
21 West	69.5275	69.5413	1948.77	91 31 42	1 38 19
22 East	69.5270	69.5408	1948.77	91 32 1	1 38 34
22 West	69.5357	69.5496	1949.08	91 31 53	1 37 44
23 East	69.5341	69.5480	1948.83	91 32 45	1 39 27
23 West	69.5299	69.5417	1948.73	91 32 35	1 38 36
24 East	69.5469	69.5609	1948.89	91 33 45	1 39 14
24 West	69.5210	69.5348	1948.27	91 34 12	1 39 15
25 East	69.5399	69.5539	1948.58	91 30 8	1 38 1
25 West	69.5474	69.5614	1948.84	91 31 16	1 38 15
Mean:		1948.86	±0.03	1° 38' 41"	±7" (±0.07)

44.

ANONYMA 23.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	A.		
16 East	56.3087	56.3186	1577.97	266° 17' 51"	176° 27' 43"
16 West	56.3084	56.3170	1578.25	266 17 36	176 27 13
17 East	56.3231	56.3330	1578.53	266 17 43	176 27 45
17 West	56.3123	56.3222	1578.30	266 19 4	176 28 49
18 East	56.3243	56.3342	1578.48	266 22 6	176 30 2
18 West	56.3127	56.3241	1578.22	266 22 6	176 29 38
19 East	56.3230	56.3329	1578.68	266 25 44	176 29 41
19 West	56.3253	56.3341	1578.75	266 26 28	176 30 0
20 East	56.3224	56.3323	1578.55	266 23 37	176 29 42
20 West	56.3265	56.3353	1578.68	266 23 54	176 29 24
21 East	56.3234	56.3333	1578.51	266 21 13	176 28 26
21 West	56.3254	56.3357	1578.73	266 22 43	176 29 19
22 East	56.3276	56.3375	1578.80	266 23 3	176 29 36
22 West	56.3138	56.3241	1578.47	266 24 8	176 29 59
23 East	56.3230	56.3329	1578.56	266 22 1	176 28 43
23 West	56.3227	56.3330	1578.61	266 22 33	176 28 34
24 East	56.3382	56.3481	1578.78	266 23 50	176 29 16
24 West	56.3277	56.3380	1578.59	266 25 3	176 30 3
25 East	56.3318	56.3417	1578.48	266 21 43	176 29 34
25 West	56.3363	56.3466	1578.65	266 22 23	176 29 21
Means		1578.53	±0.03	176° 29' 9"	±8' (±0.06)

45.

ANONYMA 24.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	22.5049	22.5147	630.93	99° 43' 22"	9° 53' 14"
16 West	22.4990	22.5078	630.79	99 43 2	9 52 39
17 East	22.4918	22.5016	630.56	99 43 20	9 53 24
17 West	22.5014	22.5102	630.83	99 44 58	9 54 45
18 East	22.5065	22.5163	630.92	99 47 56	9 55 50
18 West	22.5025	22.5124	630.83	99 47 35	9 55 6
19 East	22.4934	22.5032	630.60	99 51 31	9 55 37
19 West	22.4950	22.5049	630.66	99 51 58	9 55 39
20 East	22.4945	22.5043	630.60	99 48 13	9 54 23
20 West	22.4919	22.5018	630.55	99 47 48	9 53 24
21 East	22.4975	22.5073	630.66	99 47 21	9 54 38
21 West	22.4942	22.5041	630.63	99 47 43	9 54 22
22 East	22.4909	22.5007	630.55	99 46 33	9 53 8
22 West	22.4932	22.5031	630.65	99 46 39	9 52 31
23 East	22.5026	22.5124	630.84	99 47 55	9 54 37
23 West	22.5059	22.5158	630.95	99 47 23	9 53 25
24 East	22.4988	22.5086	630.60	99 50 34	9 56 11
24 West	22.4992	22.5091	630.65	99 48 33	9 53 43
25 East	22.4986	22.5084	630.58	99 46 37	9 54 34
25 West	22.4944	22.5052	630.49	99 47 33	9 54 35
Means		630.69	±0.03	9° 54' 18"	±11' (±0.06)

## 46.

## ALCYONE.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc		
16 East	4.1927	4.1940	117.52	199° 17' 52"	109° 27' 25"
16 West	4.1786	4.1818	117.19	199 26 32	109 35 48
17 East	4.1930	4.1942	117.53	199 30 26	109 39 58
17 West	4.1878	4.1911	117.44	199 22 39	109 31 51
18 East	4.1832	4.1852	117.28	199 21 26	109 29 19
18 West	4.1827	4.1855	117.28	199 24 42	109 32 10
19 East	4.2005	4.2018	117.78	199 14 25	109 19 27
19 West	4.1966	4.1999	117.73	199 9 42	109 14 16
20 East	4.2023	4.2035	117.80	199 13 5	109 19 52
20 West	4.2026	4.2044	117.83	199 14 46	109 20 55
21 East	4.2115	4.2127	118.05	199 6 16	109 13 57
21 West	4.2048	4.2069	117.90	199 13 42	109 20 45
22 East	4.2026	4.2039	117.82	199 11 47	109 18 41
22 West	4.1785	4.1809	117.18	199 11 20	109 17 31
23 East	4.1974	4.1987	117.65	199 12 14	109 19 10
23 West	4.1969	4.1981	117.65	199 23 34	109 29 49
24 East	4.1980	4.1992	117.69	199 54 38	109 1 15
24 West	4.1966	4.1999	117.71	199 3 29	109 9 34
25 East	4.1973	4.2046	117.81	199 4 12	109 12 40
25 West	4.2045	4.2058	117.85	199 58 4	109 5 36
Means		117.63	±0.04	109° 21' 0"	±95" (±0.05)

## 47.

## ANONYMA 25.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	65.5120	65.5224	1836.07	262° 28' 0"	172° 37' 51"
16 West	65.5222	65.5316	1836.46	262 29 13	172 38 49
18 East	65.5228	65.5332	1836.22	262 33 15	172 41 11
18 West	65.5270	65.5365	1836.36	262 31 59	172 39 31
20 East	65.5255	65.5360	1836.51	262 34 16	172 40 20
20 West	65.5309	65.5403	1836.66	262 34 17	172 39 46
22 East	65.5321	65.5426	1836.76	262 34 11	172 40 44
22 West	65.5180	65.5284	1836.43	262 34 4	172 39 55
23 East	65.5213	65.5317	1836.32	262 32 43	172 39 25
23 West	65.5275	65.5375	1836.55	262 33 40	172 39 41
25 East	65.5452	65.5556	1836.64	262 31 27	172 39 18
25 West	65.5359	65.5464	1836.43	262 33 6	172 40 4
Means		1836.45	±0.04	172° 39' 43"	±9" (±0.08)



48.

ANONYMA 26.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale	Arc.		
16 East	74.3556	74.3679	2083.90	261° 6' 53"	171° 16' 44"
16 West	74.3667	74.3780	2084.34	261 7 20	171 16 56
17 East	74.3581	74.3703	2083.91	261 7 33	171 17 34
17 West	74.3574	74.3686	2083.94	261 8 21	171 18 5
18 East	74.3435	74.3557	2083.40	261 10 18	171 18 14
18 West	74.3835	74.3954	2084.56	261 11 3	171 18 35
	Means	2084.01		171° 17' 42"	

49.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	27.2258	27.2363	763.20	234° 42' 11"	144° 51' 55"
16 West	27.2446	27.2560	763.81	234 45 13	144 54 41
	Means	763.50		144° 53' 18"	

50.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	114.1793	114.1895	3199.73	100° 26' 51"	10° 36' 43"
16 West	114.1548	114.1641	3199.26	100 27 5	10 36 42
17 East	114.1821	114.1923	3199.77	100 27 5	10 37 9
17 West	114.1781	114.1891	3199.81	100 27 40	10 37 27
18 East	114.1598	114.1702	3198.86	100 30 11	10 38 5
18 West	114.1315	114.1425	3198.16	100 29 35	10 37 6
21 East	114.1817	114.1919	3199.42	100 30 23	10 37 39
21 West	114.1769	114.1879	3199.65	100 31 17	10 37 57
22 East	114.1745	114.1847	3199.60	100 30 56	10 37 31
22 West	114.1605	114.1715	3199.35	100 32 1	10 37 53
25 East	114.2083	114.2186	3199.62	100 29 23	10 37 20
25 West	114.2029	114.2141	3199.55	100 30 15	10 37 18
	Means	3199.40 ±0.08		10° 37' 24" ±5" (±0.08)	

## 51.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	22.7840	22.7945	638.79	170° 46' 16"	80° 55' 49"
16 West	22.8055	22.8153	639.43	170 46 41	80 55 57
17 East	22.8046	22.8152	639.38	170 47 48	80 57 21
17 West	22.7764	22.7861	638.60	170 47 30	80 56 44
18 East	22.7742	22.7847	638.42	170 51 32	80 59 22
18 West	22.7824	22.7936	638.70	170 51 30	80 58 56
19 East	22.7782	22.7887	638.69	170 54 43	81 0 7
19 West	22.7803	22.7907	638.76	170 54 6	80 58 59
20 East	22.7783	22.7888	638.63	170 52 35	80 59 35
20 West	22.7881	22.7991	638.93	170 54 10	81 0 31
21 East	22.7758	22.7862	638.51	170 51 53	80 59 42
21 West	22.7733	22.7841	638.50	170 53 17	81 0 27
22 East	22.7678	22.7783	638.35	170 51 7	80 58 6
22 West	22.7760	22.7859	638.59	170 51 48	80 58 3
23 East	22.7803	22.7908	638.65	170 51 32	80 58 30
23 West	22.7790	22.7888	638.62	170 51 52	80 58 8
25 East	22.7718	22.7823	638.31	170 49 18	80 57 57
25 West	22.7954	22.8053	638.96	170 53 30	81 1 12
Means		638.71	±0.04	80° 58' 38"	±10" (±0.04)

## 52.

## ANONYMA 27.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	36.5090	36.5204	1023.45	133° 45' 35"	43° 55' 19"
16 West	36.5010	36.5136	1023.34	133 46 25	43 55 54
17 East	36.5057	36.5171	1023.39	133 47 56	43 57 49
17 West	36.5063	36.5177	1023.46	133 46 50	43 56 25
18 East	36.5035	36.5149	1023.17	133 48 33	43 56 24
18 West	36.5056	36.5176	1023.26	133 49 3	43 56 30
19 East	36.5042	36.5156	1023.18	133 54 5	43 59 0
19 West	36.4907	36.4991	1022.74	133 51 53	43 56 19
20 East	36.5005	36.5119	1023.06	133 50 13	43 56 54
20 West	36.5053	36.5175	1023.25	133 51 34	43 57 37
21 East	36.5048	36.5162	1023.16	133 50 20	43 57 56
21 West	36.4991	36.5112	1023.11	133 49 52	43 56 49
22 East	36.4833	36.4947	1022.66	133 51 3	43 57 51
22 West	36.4902	36.5039	1022.97	133 51 20	43 57 25
23 East	36.4993	36.5107	1023.05	133 49 10	43 56 0
23 West	36.5011	36.5133	1023.16	133 50 25	43 56 34
24 East	36.5050	36.5164	1022.96	133 51 48	43 58 18
24 West	36.5040	36.5170	1023.06	133 51 20	43 57 18
25 East	36.5040	36.5154	1022.94	133 47 40	43 56 2
25 West	36.5022	36.5150	1022.95	133 49 38	43 57 4
Means		1023.12	±0.03	43° 56' 59"	±9" (±0.05)

53.

ANONYMA 28.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	93.9562	93.9697	2633. <sup>''</sup> 09	250° 58' 33 <sup>''</sup>	161° 8' 22 <sup>''</sup>
16 West	93.9535	93.9671	2633.22	250 58 40	161 8 14
17 East	93.9530	93.9664	2632.91	250 58 33	161 8 30
17 West	93.9515	93.9652	2632.98	250 59 18	161 8 58
18 East	93.9657	93.9792	2633.19	251 1 55	161 9 51
18 West	93.9524	93.9660	2632.87	251 2 31	161 10 4
19 East	93.9341	93.9475	2633.03	251 6 4	161 10 1
19 West	93.9299	93.9442	2632.98	251 6 13	161 9 45
20 East	93.9470	93.9604	2633.09	251 3 3	161 9 9
20 West	93.9400	93.9531	2632.94	251 3 59	161 9 30
21 East	93.9464	93.9598	2632.87	251 1 44	161 8 58
21 West	93.9435	93.9567	2633.04	251 2 33	161 9 11
22 East	93.9494	93.9629	2633.20	251 2 26	161 9 0
22 West	93.9344	93.9492	2632.90	251 4 8	161 10 0
23 East	93.9484	93.9618	2632.94	251 2 20	161 9 2
23 West	93.9387	93.9535	2632.81	251 2 33	161 8 36
24 East	93.9379	93.9513	2632.61	251 4 11	161 9 37
24 West	93.9403	93.9534	2632.79	251 4 46	161 9 46
25 East	93.9691	93.9826	2633.12	251 1 1	161 8 53
25 West	93.9644	93.9788	2633.05	251 1 56	161 8 55
Means		2632. <sup>''</sup> 98	±0. <sup>''</sup> 02	161° 9' 13 <sup>''</sup>	±6 <sup>''</sup> (±0.07)

54.

ANONYMA 29.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	44.7532	44.7652	1254. <sup>''</sup> 50	137° 59' 26 <sup>''</sup>	48° 9' 8 <sup>''</sup>
16 West	44.7672	44.7800	1255.02	137 59 48	48 9 15
17 East	44.7619	44.7739	1254.78	137 59 45	48 9 35
17 West	44.7557	44.7680	1254.67	137 59 48	48 9 20
18 East	44.7580	44.7700	1254.46	138 3 18	48 11 8
18 West	44.7697	44.7820	1254.83	138 2 43	48 10 9
19 East	44.7546	44.7666	1254.38	138 5 50	48 10 51
19 West	44.7596	44.7726	1254.60	138 5 51	48 10 22
20 East	44.7535	44.7655	1254.33	138 3 48	48 10 32
20 West	44.7631	44.7761	1254.67	138 4 5	48 10 11
21 East	44.7655	44.7775	1254.63	138 2 38	48 10 16
21 West	44.7608	44.7738	1254.66	138 3 45	48 10 44
22 East	44.7496	44.7616	1254.33	138 3 34	48 10 24
22 West	44.7468	44.7610	1254.37	138 3 53	48 9 59
23 East	44.7470	44.7590	1254.19	138 3 7	48 9 58
23 West	44.7624	44.7754	1254.69	138 3 35	48 9 45
24 East	44.7732	44.7853	1254.63	138 4 23	48 10 47
24 West	44.7698	44.7828	1254.66	138 4 7	48 10 11
25 East	44.7713	44.7833	1254.57	138 1 56	48 10 21
25 West	44.7713	44.7843	1254.63	138 2 16	48 9 45
Means		1254. <sup>''</sup> 58	±0.03	48° 10' 8 <sup>''</sup>	±5 <sup>''</sup> (±0.03)

## 55.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	36.9900	37.0021	1036.94	166° 4' 6"	76° 13' 40"
16 West	36.9912	37.0033	1037.06	166 4 40	76 13 57
17 East	36.9904	37.0025	1036.97	166 5 13	76 14 48
17 West	36.9958	37.0079	1037.17	166 6 15	76 15 31
18 East	36.9777	36.9898	1036.44	166 7 42	76 15 32
18 West	37.0015	37.0143	1037.16	166 9 38	76 17 4
19 East	36.9924	37.0045	1037.07	166 12 42	76 18 6
19 West	36.9753	36.9886	1036.64	166 12 28	76 17 21
20 East	36.9783	36.9904	1036.58	166 9 28	76 16 28
20 West	36.9837	36.9970	1036.79	166 11 16	76 17 37
21 East	36.9892	37.0012	1036.81	166 8 41	76 16 30
21 West	36.9868	37.0002	1036.90	166 10 0	76 17 9
22 East	36.9764	36.9885	1036.56	166 9 50	76 16 49
22 West	36.9885	37.0015	1036.96	166 9 18	76 15 32
23 East	36.9889	37.0010	1036.83	166 8 55	76 15 53
23 West	36.9896	37.0026	1036.91	166 9 4	76 15 20
24 East	36.9717	36.9837	1036.26	166 9 21	76 16 22
24 West	36.9434	36.9566	1035.57	166 11 0	76 17 27
25 East	37.0069	37.0190	1037.15	166 5 53	76 14 32
25 West	36.9828	36.9970	1036 56	166 6 21	76 14 3
Means		1036.77 ±0.05		76° 15' 59" ±13" (±0.06)	

## 56.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	117.2792	117.2904	3286.44	248° 50' 48"	159° 0' 37"
16 West	117.2742	117.2870	3286.59	248 51 16	159 0 49
17 East	117.2748	117.2861	3286.20	248 51 20	159 1 16
17 West	117.2670	117.2798	3286.14	248 52 3	159 1 41
18 East	117.2712	117.2824	3286.01	248 54 37	159 2 33
18 West	117.2828	117.2956	3286.46	248 54 26	159 1 59
19 East	117.2320	117.2432	3285.86	248 59 15	159 3 13
19 West	117.2174	117.2288	3285.50	248 59 43	159 3 17
20 East	117.2673	117.2785	3286.45	248 55 18	159 1 24
20 West	117.2751	117.2861	3286.73	248 56 20	159 1 51
22 East	117.2819	117.2932	3286.91	248 55 53	159 2 28
22 West	117.2721	117.2852	3286.80	248 56 48	159 2 41
23 East	117.2684	117.2796	3286.24	248 54 58	159 1 42
23 West	117.2828	117.2960	3286.82	248 56 3	159 2 6
24 East	117.2632	117.2744	3286.04	248 57 13	159 2 41
24 West	117.2458	117.2574	3285.76	248 57 55	159 2 56
25 East	117.2957	117.3070	3286.52	248 54 12	159 2 5
25 West	117.2756	117.2892	3286.06	248 55 0	159 2 0
Means		3286.31 ±0.07		159° 2' 5" ±6" (±0.09)	



57.

26 s.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	57.3722	57.3822	1607.93	214° 29' 42"	124° 39' 19"
16 West	57.3674	57.3770	1607.91	214 30 5	124 39 25
17 East	57.3682	57.3781	1607.78	214 29 30	124 39 7
17 West	57.3708	57.3819	1607.93	214 30 20	124 39 38
18 East	57.3739	57.3838	1607.84	214 33 27	124 41 22
18 West	57.3644	57.3761	1607.66	214 33 16	124 40 46
19 East	57.3584	57.3682	1608.13	214 36 36	124 41 15
19 West	57.3577	57.3689	1608.16	214 36 55	124 41 6
20 East	57.3637	57.3735	1608.01	214 34 23	124 40 56
20 West	57.3559	57.3691	1607.90	214 34 36	124 40 31
21 East	57.3729	57.3829	1608.07	214 33 16	124 40 48
21 West	57.3668	57.3801	1608.14	214 33 40	124 40 35
22 East	57.3632	57.3730	1607.92	214 34 52	124 41 40
22 West	57.3638	57.3755	1608.03	214 34 42	124 40 47
23 East	57.3778	57.3878	1608.17	214 33 32	124 40 25
23 West	57.3673	57.3806	1608.02	214 34 55	124 41 7
24 East	57.3712	57.3811	1608.20	214 35 21	124 41 33
24 West	57.3584	57.3699	1607.94	214 35 16	124 40 58
25 East	57.3823	57.3923	1608.14	214 32 50	124 41 5
25 West	57.3753	57.3888	1608.06	214 33 17	124 40 38
Means		1608.00	±0.02	124° 40' 39"	±6" (±0.04)

58.

ATLAS.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	53.7244	53.7356	1505.81	187° 45' 21"	97° 54' 53"
16 West	53.7287	53.7391	1506.02	187 45 38	97 54 53
17 East	53.7230	53.7342	1505.77	187 45 45	97 55 15
17 West	53.7396	53.7500	1506.27	187 45 46	97 54 57
18 East	53.7382	53.7494	1506.03	187 47 56	97 55 47
18 West	53.7386	53.7519	1506.13	187 49 11	97 56 38
19 East	53.7354	53.7466	1506.49	187 49 41	97 54 57
19 West	53.7435	53.7559	1506.77	187 50 20	97 55 5
20 East	53.7421	53.7533	1506.46	187 48 23	97 55 18
20 West	53.7425	53.7551	1506.53	187 49 15	97 55 31
21 East	53.7451	53.7563	1506.40	187 46 18	97 54 4
21 West	53.7566	53.7692	1506.90	187 47 31	97 54 38
22 East	53.7366	53.7478	1506.29	187 47 45	97 54 43
22 West	53.7308	53.7424	1506.17	187 47 55	97 54 9
23 East	53.7439	53.7551	1506.33	187 47 13	97 54 11
23 West	53.7595	53.7711	1506.83	187 47 51	97 54 8
24 East	53.7304	53.7416	1506.04	187 48 8	97 54 59
24 West	53.7309	53.7440	1506.19	187 48 42	97 55 0
25 East	53.7466	53.7578	1506.23	187 46 30	97 55 5
25 West	53.7618	53.7740	1506.70	187 47 28	97 55 6
Means		1506.32	±0.05	97° 54' 58"	±5" (±0.04)

## 59.

## PLEIONE.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	53.8696	53.8812	1509.91	176° 17' 28"	86° 27' 0"
16 West	53.8734	53.8841	1510.11	176 18 40	86 27 55
17 East	53.8799	53.8898	1510.17	176 18 25	86 27 57
17 West	53.8826	53.8932	1510.33	176 18 50	86 28 3
18 East	53.8970	53.9070	1510.44	176 20 41	86 28 31
18 West	53.8876	53.8998	1510.28	176 20 58	86 28 24
19 East	53.8871	53.8970	1510.59	176 23 31	86 28 54
19 West	53.8780	53.8908	1510.43	176 24 6	86 28 58
20 East	53.8883	53.8982	1510.44	176 20 33	86 27 32
20 West	53.8818	53.8947	1510.37	176 20 51	86 27 11
21 East	53.8821	53.8920	1510.15	176 20 0	86 27 49
21 West	53.8861	53.8981	1510.46	176 21 8	86 28 18
22 East	53.8807	53.8906	1510.25	176 21 28	86 28 27
22 West	53.8816	53.8935	1510.37	176 22 17	86 28 32
23 East	53.8802	53.8918	1510.14	176 21 15	86 28 13
23 West	53.8824	53.8944	1510.26	176 21 43	86 28 0
24 East	53.8901	53.9001	1510.35	176 21 58	86 28 58
24 West	53.8838	53.8973	1510.36	176 21 55	86 28 21
25 East	53.8997	53.9097	1510.42	176 19 55	86 28 34
25 West	53.8914	53.9040	1510.27	176 19 50	86 27 32
Means		1510.30	±0.02	86° 28' 10"	±5" (±0.04)

## 60.

## ANONYMA 30.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	61.8217	61.8333	1732.66	207° 33' 1"	117° 42' 36"
16 West	61.8192	61.8299	1732.70	207 33 55	117 43 13
17 East	61.8357	61.8473	1733.02	207 34 11	117 43 45
17 West	61.8264	61.8372	1732.80	207 34 35	117 43 50
18 East	61.8386	61.8494	1732.96	207 36 35	117 44 29
18 West	61.8263	61.8377	1732.68	207 37 16	117 44 45
19 East	61.8149	61.8265	1733.10	207 40 48	117 45 39
19 West	61.7971	61.8087	1732.60	207 41 18	117 45 39
20 East	61.8284	61.8400	1733.17	207 37 48	117 44 27
20 West	61.8130	61.8257	1732.80	207 38 49	117 44 51
21 East	61.8260	61.8376	1732.91	207 36 38	117 44 14
21 West	61.8050	61.8177	1732.52	207 37 50	117 44 49
22 East	61.8122	61.8238	1732.65	207 38 41	117 45 32
22 West	61.8169	61.8281	1732.81	207 39 8	117 45 16
23 East	61.8270	61.8386	1732.88	207 37 10	117 44 5
23 West	61.8183	61.8305	1732.71	207 38 8	117 44 22
24 East	61.8043	61.8150	1732.45	207 38 50	117 45 14
24 West	61.7911	61.8027	1732.17	207 39 41	117 45 34
25 East	61.8241	61.8357	1732.63	207 35 25	117 45 46
25 West	61.8174	61.8300	1732.49	207 37 6	117 44 33
Means		1732.74	±0.04	117° 44' 32"	±8" (±0.06)

61.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	106.3549	106.3667	2980."37	238° 10' 43"	148° 20' 28'
16 West	106.3579	106.3700	2980.69	238 11 35	148 21 4
17 East	106.3577	106.3696	2980.34	238 10 48	148 20 38
17 West	106.3539	106.3660	2980.35	238 12 8	148 21 40
	Means	2980.44		148° 20' 57"	

62.

ANONYMA 31.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	66.9656	66.9765	1876."94	146° 36' 8"	56° 45' 47"
16 West	66.9585	66.9696	1876.90	146 36 40	56 46 4
17 East	66.9580	66.9688	1876.78	146 37 38	56 47 23
17 West	66.9547	66.9658	1876.78	146 38 3	56 47 30
18 East	66.9629	66.9738	1876.58	146 40 23	56 48 13
18 West	66.9654	66.9765	1876.71	146 41 0	56 48 26
19 East	66.9567	66.9676	1876.52	146 43 35	56 48 46
19 West	66.9507	66.9640	1876.49	146 43 23	56 48 4
20 East	66.9529	66.9638	1876.35	146 41 23	56 48 14
20 West	66.9579	66.9703	1876.59	146 41 43	56 47 56
21 East	66.9664	66.9773	1876.65	146 40 16	56 47 59
21 West	66.9581	66.9704	1876.66	146 38 36	56 45 40
22 East	66.9555	66.9664	1876.56	146 41 0	56 47 53
22 West	66.9541	66.9662	1876.61	146 42 30	56 48 40
23 East	66.9510	66.9618	1876.30	146 40 25	56 47 19
23 West	66.9491	66.9629	1876.41	146 41 27	56 47 39
24 East	66.9747	66.9857	1876.62	146 42 22	56 49 10
24 West	66.9602	66.9726	1876.38	146 42 45	56 49 0
25 East	66.9743	66.9853	1876.55	146 39 23	56 47 54
25 West	66.9649	66.9789	1876.42	146 40 35	56 48 10
	Means	1876."59	±0.03	56° 47' 48"	±9" (±0.09)

## 63.

## ANONYMA 32.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	68.0244	68.0358	1906.62	149° 5' 37"	59° 15' 15"
16 West	68.0219	68.0335	1906.72	149 6 5	59 15 27
17 East	68.0203	68.0317	1906.56	149 6 51	59 16 34
17 West	68.0195	68.0312	1906.62	149 6 48	59 16 13
18 East	68.0345	68.0460	1906.62	149 8 41	59 16 31
18 West	68.0303	68.0420	1906.56	149 9 41	59 17 7
19 East	68.0202	68.0317	1906.37	149 12 4	59 17 18
19 West	68.0132	68.0256	1906.26	149 12 14	59 16 57
20 East	68.0277	68.0392	1906.49	149 9 28	59 16 21
20 West	68.0264	68.0388	1906.54	149 10 20	59 16 34
21 East	68.0324	68.0439	1906.54	149 8 28	59 16 12
21 West	68.0280	68.0404	1906.64	149 9 18	59 16 23
22 East	68.0134	68.0248	1906.22	149 9 51	59 16 46
22 West	68.0085	68.0204	1906.17	149 10 38	59 16 48
23 East	68.0198	68.0312	1906.27	149 9 0	59 15 54
23 West	68.0204	68.0323	1906.37	149 9 0	59 15 13
24 East	68.0456	68.0571	1906.66	149 10 52	59 17 42
24 West	68.0264	68.0388	1906.28	149 11 0	59 17 17
25 East	68.0416	68.0531	1906.48	149 7 38	59 16 11
25 West	68.0353	68.0476	1906.37	149 8 50	59 16 26
Means		1906.47	±0.03	59° 16' 28" ±6" (±0.06)	

## 64.

## ANONYMA 33.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	63.2988	63.3094	1774.14	163° 36' 13"	73° 45' 47"
16 West	63.2943	63.3058	1774.18	163 36 22	73 45 40
17 East	63.3009	63.3115	1774.23	163 37 37	73 47 13
17 West	63.2832	63.2954	1773.86	163 37 28	73 46 45
18 East	63.3048	63.3154	1774.06	163 39 33	73 47 23
18 West	63.3070	63.3190	1774.21	163 40 8	73 47 33
19 East	63.2945	63.3050	1774.09	163 43 0	73 48 24
19 West	63.2782	63.2912	1773.74	163 42 41	73 47 34
20 East	63.2849	63.2953	1773.68	163 40 26	73 47 25
20 West	63.2919	63.3035	1773.95	163 41 2	73 47 22
21 East	63.3022	63.3128	1774.07	163 38 53	73 46 42
21 West	63.2872	63.2988	1773.84	163 40 15	73 47 24
22 East	63.2832	63.2937	1773.68	163 40 39	73 47 37
22 West	63.2840	63.2956	1773.80	163 41 23	73 47 37
23 East	63.2992	63.3097	1774.00	163 40 25	73 47 22
23 West	63.2910	63.3027	1773.87	163 41 10	73 47 26
24 East	63.3064	63.3170	1774.05	163 41 39	73 48 40
24 West	63.2756	63.2886	1773.37	163 41 18	73 47 45
25 East	63.3081	63.3187	1773.94	163 38 10	73 46 48
25 West	63.3008	63.3124	1773.80	163 39 11	73 46 52
Means		1773.93	±0.03	73° 47' 16" ±6" (±0.05)	



65.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	114.4380	114.4488	3206''.80	234° 45' 6''	144° 54' 50''
16 West	114.4458	114.4575	3207.28	234 45 12	144 54 40
17 East	114.4454	114.4563	3206.88	234 46 26	144 56 14
17 West	114.4334	114.4438	3206.64	234 46 52	144 56 22
18 East	114.4451	114.4559	3206.80	234 49 6	144 57 2
18 West	114.4340	114.4440	3206.54	234 49 20	144 56 52
	Means	3206''.82		144° 56' 0''	

66.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	120.8330	120.8446	3385''.97	234° 30' 0''	144° 39' 44''
16 West	120.8417	120.8538	3386.50	234 30 41	144 40 9
17 East	120.8494	120.8611	3386.32	234 30 41	144 40 29
17 West	120.8402	120.8511	3386.16	234 31 33	144 41 3
18 East	120.8653	120.8757	3386.64	234 32 33	144 40 29
18 West	120.8492	120.8616	3386.32	234 34 23	144 41 55
19 East	120.8012	120.8128	3386.20	234 37 23	144 41 34
19 West	120.8042	120.8165	3386.31	234 38 18	144 42 3
20 East	120.8260	120.8376	3386.37	234 34 55	144 41 9
20 West	120.8104	120.8243	3386.05	234 35 39	144 41 18
21 East	120.8510	120.8626	3386.73	234 33 54	144 41 14
21 West	120.8240	120.8379	3386.35	234 34 52	144 41 36
22 East	120.8252	120.8368	3386.28	234 34 43	144 41 22
22 West	120.8188	120.8339	3386.30	234 35 33	144 41 30
23 East	120.8410	120.8526	3386.39	234 34 19	144 41 6
23 West	120.8317	120.8468	3386.33	234 35 20	144 41 26
24 East	120.8129	120.8245	3385.87	234 36 32	144 42 13
24 West	120.7716	120.7853	3384.91	234 37 30	144 42 43
25 East	120.8477	120.8593	3386.19	234 33 36	144 41 36
25 West	120.8393	120.8539	3385.06	234 33 52	144 40 59
	Means	3386''.16	±0''.06	144° 41' 17''	±6'' (±0''.10)

67.

ANONYMA 34.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	86.9506	86.9627	2436''.76	215° 44' 41''	125° 54' 18''
16 West	86.9474	86.9606	2436.88	215 45 0	125 54 20
17 East	86.9521	86.9642	2436.73	215 45 40	125 55 17
17 West	86.9611	86.9744	2437.10	215 46 12	125 55 30
18 East	86.9595	86.9716	2436.81	215 48 16	125 56 11
18 West	86.9537	86.9670	2436.75	215 48 36	125 56 6
19 East	86.9209	86.9329	2436.83	215 51 53	125 56 30
19 West	86.9138	86.9274	2436.69	215 52 25	125 56 35
20 East	86.9367	86.9487	2436.85	215 49 27	125 55 58
20 West	86.9331	86.9471	2436.83	215 50 7	125 56 1
21 East	86.9464	86.9584	2436.84	215 48 17	125 55 48
21 West	86.9322	86.9461	2436.72	215 49 28	125 56 22
22 East	86.9438	86.9559	2436.94	215 49 46	125 56 34
22 West	86.9365	86.9500	2436.85	215 50 8	125 56 13
23 East	86.9407	86.9527	2436.62	215 48 40	125 55 32
23 West	86.9306	86.9445	2436.45	215 49 30	125 55 42
24 East	86.9378	86.9498	2436.84	215 50 8	125 56 18
24 West	86.9321	86.9460	2436.83	215 50 38	125 56 18
25 East	86.9482	86.9602	2436.58	215 47 0	125 55 14
25 West	86.9593	86.9742	2437.00	215 48 22	125 55 42
Means		2436''.80	±0''.02	125° 55' 50''	±6'' (±0''.07)

68.

ANONYMA 36.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	76.2329	76.2458	2136''.62	169° 15' 5''	79° 24' 38''
16 West	76.2103	76.2243	2136.20	169 16 13	79 25 29
17 East	76.2298	76.2426	2136.58	169 16 34	79 26 8
17 West	76.1983	76.2122	2135.80	169 17 3	79 26 18
18 East	76.2321	76.2450	2136.30	169 19 40	79 27 30
18 West	76.2249	76.2385	2136.17	169 20 5	79 27 31
20 East	76.2129	76.2256	2136.05	169 20 5	79 27 5
20 West	76.2151	76.2278	2136.15	169 20 37	79 26 58
21 East	76.2070	76.2197	2135.73	169 19 16	79 27 5
21 West	76.1988	76.2137	2135.76	169 19 48	79 26 58
22 East	76.2139	76.2268	2136.12	169 20 40	79 27 39
22 West	76.1980	76.2131	2135.81	169 21 12	79 27 27
23 East	76.2178	76.2306	2136.06	169 19 55	79 26 53
23 West	76.2124	76.2276	2136.04	169 20 25	79 26 41
24 East	76.2104	76.2231	2135.73	169 19 58	79 26 59
24 West	76.2098	76.2241	2135.88	169 20 58	79 27 25
25 East	76.2106	76.2233	2135.50	169 18 28	79 27 7
25 West	76.2057	76.2212	2135.47	169 18 55	79 26 37
Means		2136''.00	±0''.05	79° 26' 48''	±6'' (±0''.06)

69.

ANONYMA 37.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	81.6036	81.6173	2287.17	157° 33' 25"	67° 43' 1"
16 West	81.5974	81.6099	2287.17	157 33 44	67 43 4
17 East	81.5989	81.6126	2286.76	157 33 58	67 43 47
17 West	81.5906	81.6031	2286.58	157 34 22	67 43 54
18 East	81.6047	81.6184	2286.88	157 36 55	67 44 45
18 West	81.6010	81.6154	2286.86	157 37 52	67 45 17
19 East	81.5991	81.6129	2287.05	157 40 11	67 45 32
19 West	81.5916	81.6051	2286.88	157 41 1	67 45 51
20 East	81.5871	81.6008	2286.55	157 37 36	67 44 33
20 West	81.5889	81.6046	2286.72	157 38 18	67 44 36
21 East	81.5980	81.6117	2286.74	157 36 55	67 44 42
21 West	81.5959	81.6101	2286.91	157 38 6	67 45 14
22 East	81.5870	81.6007	2286.66	157 37 42	67 44 39
22 West	81.5839	81.5971	2286.64	157 38 29	67 44 42
23 East	81.5966	81.6103	2286.76	157 37 20	67 44 16
23 West	81.6000	81.6132	2286.93	157 37 53	67 44 7
24 East	81.6111	81.6248	2286.86	157 38 45	67 45 42
24 West	81.5891	81.6036	2286.44	157 38 53	67 45 17
25 East	81.6189	81.6326	2286.94	157 35 53	67 44 30
25 West	81.6104	81.6239	2286.84	157 37 11	67 44 51
	Means	2286.82	±0.03	67° 44' 37"	±7" (±0.04)

70.

Plate.	Observed Distance.	Corrected Distan		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	79.2524	79.2643	2221.10	194° 28' 3"	104° 37' 35"
16 West	79.2185	79.2324	2220.39	194 29 30	104 38 45
17 East	79.2408	79.2527	2220.77	194 28 58	104 38 29
17 West	79.2267	79.2406	2220.51	194 30 15	104 39 26
	Means	2220.69		104° 38' 34"	

71.

ANONYMA 38.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	84.1302	84.1413	2357.74	203° 9' 58"	113° 19' 32"
16 West	84.1268	84.1418	2357.94	203 10 2	113 19 19
17 East	84.1420	84.1533	2358.03	203 10 55	113 20 27
17 West	84.1340	84.1489	2358.00	203 10 48	113 20 1
18 East	84.1343	84.1466	2357.65	203 13 15	113 21 8
18 West	84.1413	84.1557	2357.97	203 13 46	113 21 15
19 East	84.1000	84.1123	2357.74	203 16 9	113 21 6
19 West	84.1011	84.1168	2357.87	203 16 40	113 21 7
20 East	84.1158	84.1269	2357.73	203 14 13	113 20 56
20 West	84.1150	84.1307	2357.88	203 14 48	113 20 53
21 East	84.1240	84.1363	2357.74	203 12 57	113 20 36
21 West	84.1188	84.1330	2357.86	203 13 33	113 20 34
22 East	84.1206	84.1329	2357.81	203 14 15	113 21 8
22 West	84.1118	84.1260	2357.69	203 14 51	113 21 1
23 East	84.1278	84.1390	2357.74	203 13 25	113 20 21
23 West	84.1304	84.1447	2357.97	203 14 6	113 20 21
24 East	84.1144	84.1267	2357.69	203 14 28	113 20 59
24 West	84.0955	84.1178	2357.53	203 15 12	113 21 12
25 East	84.1275	84.1399	2357.54	203 11 58	113 20 23
25 West	84.1417	84.1556	2358.00	203 12 48	113 20 18
Means		2357.81	±0.03	113° 20' 38"	±5" (±0.06)

72.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	110.6276	110.6411	3100.45	139° 24' 30"	49° 34' 12"
16 West	110.6162	110.6297	3100.38	139 25 38	49 35 4
17 East	110.6581	110.6717	3101.37	139 25 58	49 35 47
17 West	110.6114	110.6245	3100.20	139 26 18	49 35 50
22 East	110.6088	110.6223	3099.72	139 29 33	49 36 24
22 West	110.6166	110.6303	3100.07	139 29 38	49 35 45
23 East	110.6181	110.6316	3099.80	139 28 36	49 35 28
23 West	110.6253	110.6392	3100.13	139 29 5	49 35 15
Means		3100.26		49° 35' 28"	



73.

ANONYMA 39.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	103.3593	103.3714	2896.74	150° 58' 8"	61° 7' 46"
16 West	103.3584	103.3699	2896.95	150 58 48	61 8 10
17 East	103.3619	103.3740	2896.88	150 59 8	61 8 50
17 West	103.3443	103.3572	2896.55	150 59 35	61 8 59
18 East	103.3556	103.3676	2896.19	151 2 25	61 10 15
18 West	103.3635	103.3779	2896.56	151 2 20	61 9 46
19 East	103.3586	103.3707	2896.54	151 4 52	61 10 8
19 West	103.3541	103.3685	2896.57	151 4 29	61 9 14
20 East	103.3590	103.3710	2896.42	151 2 30	61 9 24
20 West	103.3652	103.3809	2896.77	151 3 8	61 9 23
21 East	103.3739	103.3859	2896.71	151 1 40	61 9 25
21 West	103.3559	103.3715	2896.59	151 2 5	61 9 10
22 East	103.3527	103.3647	2896.42	151 2 44	61 9 39
22 West	103.3496	103.3636	2896 50	151 3 26	61 9 37
23 East	103.3626	103.3746	2896.51	151 2 10	61 9 5
23 West	103.3614	103.3754	2896.64	151 2 40	61 8 53
24 East	103.3749	103.3870	2896.37	151 3 8	61 10 0
24 West	103.3713	103.3857	2896.52	151 3 22	61 9 41
25 East	103.3912	103.4034	2896.72	151 1 11	61 9 45
25 West	103.3787	103.3926	2896.46	151 1 18	61 8 55
Means		2896.58	±0.03	61° 9' 19"	±5" (±0.07)

74.

ANONYMA 40.

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	105.2248	105.2350	2948.78	189° 53' 32"	100° 3' 4"
16 West	105.2201	105.2339	2948.99	189 54 13	100 3 28
17 East	105.2324	105.2428	2949.00	189 55 3	100 4 33
17 West	105.2132	105.2269	2948.67	189 55 19	100 4 30
18 East	105.2472	105.2576	2949.09	189 57 33	100 5 25
18 West	105.2372	105.2505	2948.96	189 57 33	100 5 0
19 East	105.2013	105.2115	2948.92	189 59 59	100 5 12
19 West	105.1928	105.2073	2948.82	190 0 25	100 5 7
20 East	105.2079	105.2182	2948.66	189 58 30	100 5 23
20 West	105.2130	105.2261	2948.92	189 58 55	100 5 10
21 East	105.2280	105.2384	2948.94	189 57 12	100 4 57
21 West	105.2188	105.2335	2949.07	189 57 31	100 4 38
22 East	105.2154	105.2257	2948.81	189 58 14	100 5 11
22 West	105.2095	105.2247	2948.85	189 58 36	100 4 50
23 East	105.2249	105.2353	2948.78	189 57 27	100 4 25
23 West	105.2270	105.2422	2949.07	189 57 56	100 4 12
24 East	105.2217	105.2320	2948.91	189 58 51	100 5 40
24 West	105.1854	105.1999	2948.15	189 59 3	100 5 19
25 East	105.2503	105.2607	2949.16	189 56 5	100 4 38
25 West	105.2339	105.2493	2948.87	189 56 51	100 4 28
Means		2948.87	±0.03	100° 4' 46"	±6" (±0.08)

**75.**

Plate.	Observed Distance.	Corrected Distance.		Observed Pos. Angle.	Corrected Pos. Angle.
		Scale.	Arc.		
16 East	130.7987	130.8036	366 <sup>''</sup> 5.30	155° 41' 18''	65° 50' 54''
16 West	130.7585	130.7619	3664.45	155 41 18	65 50 38
22 East	130.7115	130.7162	3662.75	155 44 58	65 51 54
22 West	130.6901	130.6950	3662.29	155 46 5	65 52 17
23 East	130.7306	130.7353	3663.02	155 45 5	65 52 1
23 West	130.6944	130.7015	3662.21	155 45 43	65 51 57
	Means		3663 <sup>''</sup> .34	65° 51' 37''	

## VIII.

## FINAL RESULTS.

THE final results of the photographic measures have been arranged in two tables which will now be given. The TABLE OF MEAN RESULTS requires no explanation, except that in the column of remarks, *P* refers to the Paris catalogue of the Pleiades;\* *Y*, to the Yale catalogue; and *B*, to ARGELANDER'S Bonn catalogue. The magnitudes are those of ARGELANDER. In the computation of  $\alpha' - \alpha$  and  $\delta' - \delta$  from the distance and position angle, the following formulæ have been found very convenient and accurate:—

Let  $\alpha$  and  $\delta$  be the right ascension and declination of the central star.

$\alpha'$  and  $\delta'$  the same quantities for any other star.

$\sigma$  the true distance between the two stars.

$\pi$  the true position angle, *at the central star*.

Then if we put:

$$m = \sigma \cos \pi$$

$$n = \sigma \sin \pi$$

we shall have:†

$$\begin{aligned} \delta' - \delta = m &- [4.384545] n^2 \tan \delta \\ &- [8.59300] n^2 m (1 + 3 \tan^2 \delta) \\ &+ [2.67651] n^4 \tan \delta (1 + 3 \tan^2 \delta) \\ &- [3.27875] n^2 m^2 \tan \delta (2 + 3 \tan^2 \delta) \end{aligned}$$

$$\begin{aligned} \cos \delta (\alpha' - \alpha) = n &+ [4.685575] n m \tan \delta \\ &- [8.89403] n^3 \tan^2 \delta \\ &+ [8.89403] n m^2 (1 + 3 \tan^2 \delta) \\ &- [3.57960] n^3 m \tan \delta (1 + 3 \tan^2 \delta) \\ &+ [3.57960] n m^3 \tan \delta (2 + 3 \tan^2 \delta) \end{aligned}$$

where the numbers in square brackets are logarithms.

\* Annales de l'Observatoire de Paris, Observations, t. 29, 1874. Catalogue du Groupe des Pléiades, par M. C. Wolf.

† For a demonstration of these formulæ, see Jordan, Handbuch der Vermessungskunde, dritte Auflage, 1890, vol. iii, p. 319.

If we introduce into these general formulæ the value of  $\delta$  for the central star 24 *p*, namely:

$$\delta = + 23^{\circ} 43' 15''.8,$$

we shall have:

$$\begin{aligned} \delta' - \delta &= m - [4.02741] n^2 \\ &\quad - [8.79144] n^2 m \\ &\quad + [2.5178] n^4 \\ &\quad - [3.3329] n^2 m^2 \end{aligned}$$

$$\begin{aligned} \alpha' - \alpha &= [0.038334] n + [4.36678] n m \\ &\quad - [8.21809] n^3 \\ &\quad + [9.13080] n m^2 \\ &\quad - [3.4592] n^3 m \\ &\quad + [3.6723] n m^3 \end{aligned}$$

The last two terms of both expressions are insensible.

The second table, headed CATALOGUE OF THE PLEIADES, contains the final places of all the stars, as derived from the photographic measures alone, the following co-ordinates for 1873.0 having been adopted for 24 *p*.

$$\alpha = 54^{\circ} 57' 3''.47 \qquad \delta = + 23^{\circ} 43' 15''.84$$

This adopted position produces the best general agreement between the photographic positions of the several stars, and their places interpolated to 1873.0 from the Yale and Königsberg heliometer measures. It does not differ very greatly from the heliometer place, which is:

$\alpha$			$\delta$			
$^{\circ}$	$'$	$''$	$^{\circ}$	$'$	$''$	
54	57	3.61	23	43	15.58	ELKIN,
54	57	3.63	23	43	15.81	AUWERS,
54	57	3.55	23	43	15.61	NEWCOMB,

according to the authority we accept for the place of *Alcyone*. Moreover, it is worthy of remark that the place of 24 *p* derived by ELKIN from his *second* triangulation, agrees much more closely with that adopted in the present paper, than the place given above as finally deduced by him from both his triangulations. The second triangulation gives:

$$\alpha = 54^{\circ} 57' 3''.40 \qquad \delta = 23^{\circ} 43' 15''.57$$

Possibly the difficulty of measuring very short distances with the heliometer, or the peculiar systematic errors liable to affect such



measures, have operated to diminish the accuracy of ELKIN's determination of  $24\ p$  in his first triangulation by means of position angles and distances from *Alcyone*. More than nine-tenths of the error made in measuring its distance would enter into the right ascension of  $24\ p$ . This would account for the large difference found in the right ascensions, while the declinations from the two triangulations agree very closely. Of course the position derived from ELKIN's second triangulation would be quite free from the sources of error just mentioned. For in this case the stars are located by measuring their distances from four fundamental stars forming a quadrilateral large enough to include nearly the whole cluster. There were therefore no short distances in this determination of  $24\ p$ .

The rather large discordance of the photographic position of *Alcyone* is perhaps due to the imperfection of the photographic images of this comparatively bright star. This discordance amounts to  $0''.47$  in right ascension, and  $0''.07$  in declination, if we adopt ELKIN's position of *Alcyone*, which is, for 1873.0:

$$\alpha = 54^{\circ} 59' 4''.21 \qquad \delta = 23^{\circ} 42' 36''.93.$$

The values given for the precessions and secular variations depend upon the Pulcowa constants, and have been calculated with the aid of the tables given by ELKIN.

The third term of precession, or coefficient of  $\left(\frac{t}{100}\right)^3$ , is:

$$\begin{aligned} & - 0''.059 \text{ in Right Ascension,} \\ & - 0''.159 \text{ in Declination.} \end{aligned}$$

The total precession to reduce the catalogue places to 1873 +  $t$  will therefore be:

$$(\text{precession})\ t + (\text{sec. var.})\ \frac{t^2}{200} + (\text{third term})\ \left(\frac{t}{100}\right)^3.$$

TABLE OF MEAN RESULTS.

Current No.	Name.	Mag.	Distance. 1873.0.	Position Angle. 1873.0.	$\alpha' - \alpha$ . 1873.0.	$\delta' - \delta$ . 1873.0.	Remarks.
1		8.3	3120.08	286° 53' 28"	-3267.27	+ 879.02	P, 11; Y, 1.
2		8.4	3448.23	240 21 48	-1714.88	-1714.62	P, 12.
3		8.0	3169.33	299 34 39	-3020.78	+1556.22	P, 20; Y, 2.
4		9.1	2430.47	270 54 36	-2654.62	+ 32.31	P, 47; Y, 3.
5		8.7	2598.99	292 12 50	-2633.63	+ 976.39	P, 51; Y, 4.
6	<i>Celano, 16 g</i>	6.5	2181.67	286 6 5	-2292.45	+ 600.35	P, 62; Y, 5.
7	<i>Electra, 17 b</i>	4.7	2033.12	269 11 28	-2220.38	- 33.10	P, 66; Y, 6.
8		8.9	3679.02	213 29 31	-2203.25	-3072.47	B, +22.537.
9		8.9	1915.03	285 33 6	-2017.37	+ 509.80	P, 72; Y, 7.
10		8.6	2383.58	230 49 47	-2012.03	-1509.14	P, 73; Y, 8.
11	<i>18 m</i>	6.3	3159.87	324 55 32	-1994.43	+2582.50	P, 76; Y, 9.
12	<i>Trugeta, 19 e</i>	5.0	2104.35	305 11 30	-1937.15	+1243.99	P, 79; Y, 10.
13		8.9	3332.14	329 58 34	-1832.50	+2882.01	P, 84; Y, 11.
14		8.4	3658.58	205 45 21	-1724.52	-3297.76	B, +22.541.
15	<i>Anon.</i>	8.2	1600.33	258 57 15	-1714.49	- 309.23	P, 91; Y, 13.
16	<i>Anon. 2</i>	8.8	1919.44	310 4 12	-1608.65	+1233.27	P, 101; Y, 14.
17	<i>Anon. 4</i>	8.1	1618.02	298 39 55	-1553.29	+ 773.99	P, 105; Y, 17.
18	<i>Anon. 5</i>	9.1	2298.67	322 35 56	-1531.01	+1823.97	P, 107; Y, 18.
19	<i>Anon. 6</i>	9.0	1497.89	293 55 43	-1497.45	+ 605.53	P, 109; Y, 19.
20	<i>Maia, 20 c</i>	4.8	1543.86	305 20 47	-1378.12	+ 891.45	P, 115; Y, 20.
21		8.0	3711.65	199 24 33	-1337.40	-3502.31	B, +22.545.
22	<i>Anon. 7</i>	8.2	1255.74	256 37 16	-1333.56	-292.15	P, 120; Y, 21.
23	<i>Asterope, 21 k</i>	7.0	1972.03	322 34 39	-1313.38	+1564.60	P, 121; Y, 22.
24	<i>22 l</i>	7.0	1826.53	323 59 6	-1186.22	+1469.88	P, 129; Y, 23.
25	<i>Anon. 8</i>	8.0	963.95	286 37 8	-1009.52	+ 274.78	P, 141; Y, 24.

TABLE OF MEAN RESULTS.—Continued.

Current No.	Name.	Mag.	Distance. 1873.0.	Position Angle. 1873.0.	$\alpha' - \alpha$ . 1873.0.	$\delta' - \delta$ . 1873.0.	Remarks.
26	Anon. 9	8.1	928.77	285° 59' 42"	— 975.73	+ 255.07	P, 143; Y, 25.
27	Merope, 23 d	4.5	1036.78	233 43 44	— 911.83	+ 614.11	P, 146; Y, 26.
28	Anon. 10	8.0	889.48	303 34 45	— 810.26	+ 491.37	P, 151; Y, 27.
29		8.4	1884.93	199 19 59	— 679.06	— 1779.06	P, 161; Y, 28.
30	Anon. 11	9.1	573.08	264 43 17	— 623.24	— 53.08	P, 169; Y, 29.
31	Anon. 12	7.5	1483.91	347 53 17	— 341.15	+ 1450.78	P, 182; Y, 30.
32		8.4	2544.03	353 59 52	— 292.16	+ 2539.00	P, 188; Y, 31.
33	Anon. 13	8.5	493.22	207 16 12	— 246.61	— 438.45	P, 192; Y, 32.
34		9.2	597.02	344 47 36	— 171.26	+ 576.09	P, 196; Y, 33.
35	Anon. 14	9.0	1217.34	186 22 36	— 147.30	— 1209.82	P, 198; Y, 34.
36	Anon. 15	8.5	75.11	304 42 1	— 67.46	+ 42.76	P, 202; Y, 35.
37	Anon. 17	7.9	1405.53	181 16 4	— 33.87	— 1405.18	P, 208; Y, 36.
38	Anon. 18	8.0	85.48	343 39 39	— 26.26	+ 82.04	P, 209; Y, 37.
39	24 p	8.0	0.00		0.00	0.00	P, 212; Y, 38.
40	Anon. 19	7.5	1126.77	179 24 21	+ 12.73	— 1126.71	P, 213; Y, 39.
41	Anon. 20	8.0	1700.28	0 45 21	+ 24.58	+ 1700.13	P, 214; Y, 40.
42	Anon. 22	7.0	727.73	175 42 56	+ 59.30	— 725.70	P, 217; Y, 42.
43	Anon. 21	8.6	1948.86	1 38 41	+ 61.35	+ 1948.05	P, 219; Y, 41.
44	Anon. 23	8.0	1578.53	176 29 9	+ 105.34	— 1575.57	P, 225; Y, 43.
45	Anon. 24	7.0	630.69	9 54 18	+ 118.66	+ 621.28	P, 226; Y, 44.
46	Alcyone, 25 n	3.0	117.63	109 21 0	+ 121.21	— 38.98	P, 227; Y, 45.
47	Anon. 25	8.2	1836.45	172 39 43	+ 255.22	— 1821.47	P, 235; Y, 46.
48	Anon. 26	9.0	2084.01	171 17 42	+ 343.03	— 2060.11	P, 245; Y, 47.
49		9.4	763.50	144 53 18	+ 479.03	— 624.77	P, 249.
50		7.0	3199.40	10 37 24	+ 648.64	+ 3144.18	Y, 48.

TABLE OF MEAN RESULTS.—Concluded.

Current No.	Name.	Mag.	Distance. 1873.0.	Position Angle. 1873.0.	$\alpha' - \alpha$ . 1873.0.	$\delta' - \delta$ . 1873.0.	Remarks.
51	Anon. 27	9.2	638.71	80° 58' 38"	+ 689.17	+ 99.74	P, 275.
52	Anon. 28	8.5	1023.12	43 56 59	+ 776.83	+ 736.06	P, 280; Y, 49.
53	Anon. 28	7.0	2632.98	161 9 13	+ 924.17	-2492.58	P, 293; Y, 51.
54	Anon. 29	7.8	1254.58	48 10 8	+ 1022.89	+ 835.80	P, 300; Y, 52.
55		9.0	1036.77	76 15 59	+ 1100.65	+ 245.06	P, 307; Y, 53.
56		8.5	3286.31	159 2 5	+ 1276.10	-3070.19	B, +22.565.
57	26 s	7.0	1608.00	124 40 39	+ 1441.58	- 916.73	P, 338; Y, 54.
58	Atlas, 27 <sup>f</sup>	4.0	1506.32	97 54 58	+ 1628.91	- 209.83	P, 349; Y, 55.
59	Pleiade, 28 <sup>h</sup>	6.2	1510.30	86 28 10	+ 1046.86	+ 90.59	P, 353; Y, 56.
60	Anon. 30	8.4	1732.74	117 44 32	+ 1672.19	- 809.07	P, 358; Y, 57.
61		9.0	2980.44	148 20 57	+ 1699.17	-2539.71	P, 362.
62	Anon. 31	8.0	1876.59	56 47 48	+ 1718.87	+ 1024.99	P, 365; Y, 58.
63	Anon. 32	7.5	1906.47	59 16 28	+ 1793.80	+ 971.19	P, 370; Y, 59.
64	Anon. 33	7.8	1773.93	73 47 16	+ 1862.55	+ 492.17	P, 376; Y, 60.
65		8.7	3206.82	144 56 0	+ 2001.33	-2628.29	P, 388.
66		8.4	3386.16	144 41 17	+ 2125.52	-2767.19	P, 403.
67	Anon. 34	7.2	2436.80	125 55 50	+ 2148.71	-1434.04	P, 406; Y, 62.
68	Anon. 36	8.5	2136.00	79 26 48	+ 2295.53	+ 386.50	P, 415; Y, 64.
69	Anon. 37	7.9	2286.82	67 44 37	+ 2316.02	+ 861.35	P, 418; Y, 65.
70		9.4	2220.69	104 38 34	+ 2344.01	- 566.27	P, 420.
71	Anon. 38	7.5	2357.81	113 20 38	+ 2359.87	- 939.24	P, 423; Y, 66.
72		9.0	3100.26	49 35 28	+ 2589.65	+ 2003.71	P, 463; Y, 67.
73	Anon. 39	7.7	2896.58	61 9 19	+ 2779.62	+ 1390.51	P, 447; Y, 68.
74	Anon. 40	7.3	2948.87	100 4 46	+ 3167.76	- 525.03	P, 473; Y, 69.
75		8.9	3663.34	65 51 37	+ 3663.17	+ 1486.16	P, 503.



## CATALOGUE OF THE PLEIADES.

No.	Name.	Mag.	Right Ascension, 1873 $\alpha$ .	Precess.	Sec. Var.	Declination, 1873 $\alpha$ .	Precess.	Sec. Var.
1		8.3	54 2 36.20	+53.3005	+0.2708	+23 58' 12.86	+11.7756	-0.4250
2		8.4	54 2 41.59	+53.0558	+0.2647	+23 14 41.22	+11.7750	-0.4229
3		8.0	54 6 42.69	+53.3690	+0.2722	+24 9 12.06	+11.7562	-0.4259
4		9.1	54 12 48.85	+53.2345	+0.2680	+23 43 48.15	+11.7274	-0.4254
5		8.7	54 13 9.84	+53.3242	+0.2703	+23 59 32.23	+11.7256	-0.4261
6	<i>Caleno</i> , 16 <i>g</i>	6.5	54 18 51.02	+53.2973	+0.2689	+23 53 16.19	+11.6989	-0.4264
7	<i>Electra</i> , 17 <i>b</i>	4.7	54 20 3.09	+53.2394	+0.2672	+23 42 42.74	+11.6929	-0.4260
8		8.9	54 20 20.22	+52.9554	+0.2598	+22 52 3.37	+11.6917	-0.4237
9		8.9	54 23 26.10	+53.2955	+0.2684	+23 51 45.04	+11.6770	-0.4268
10		8.6	54 23 31.44	+53.1056	+0.2633	+23 18 6.70	+11.6764	-0.4253
11	18 <i>m</i>	6.3	54 23 49.04	+53.4926	+0.2735	+24 26 18.34	+11.6753	-0.4284
12	<i>Taygeta</i> , 19 <i>e</i>	5.0	54 24 46.32	+53.3670	+0.2701	+24 3 59.83	+11.6707	-0.4275
13		8.9	54 26 30.97	+53.5255	+0.2740	+24 31 17.85	+11.6623	-0.4289
14		8.4	54 28 18.95	+52.9456	+0.2588	+22 48 18.08	+11.6540	-0.4244
15	<i>Anon.</i> 1	8.2	54 28 28.98	+53.2258	+0.2659	+23 38 6.61	+11.6530	-0.4266
16	<i>Anon.</i> 2	8.8	54 30 14.82	+53.3742	+0.2697	+24 3 49.11	+11.6448	-0.4280
17	<i>Anon.</i> 4	8.1	54 31 10.18	+53.3323	+0.2684	+23 56 9.83	+11.6402	-0.4275
18	<i>Anon.</i> 5	9.1	54 31 32.46	+53.4320	+0.2710	+24 13 39.81	+11.6385	-0.4285
19	<i>Anon.</i> 6	9.0	54 32 6.02	+53.3175	+0.2679	+23 53 21.37	+11.6358	-0.4277
20	<i>Maia</i> , 20 <i>c</i>	4.8	54 34 5.35	+53.3477	+0.2685	+23 58 7.29	+11.6263	-0.4281
21		8.0	54 34 46.07	+52.9356	+0.2580	+22 44 53.53	+11.6229	-0.4249
22	<i>Anon.</i> 7	8.2	54 34 49.91	+53.2369	+0.2655	+23 38 23.69	+11.6228	-0.4273
23	<i>Asteropé</i> , 21 <i>k</i>	7.0	54 35 10.09	+53.4133	+0.2701	+24 9 20.44	+11.6212	-0.4287
24	22 <i>l</i>	7.0	54 37 17.25	+53.4076	+0.2697	+24 7 45.72	+11.6111	-0.4288
25	<i>Anon.</i> 8	8.0	54 40 13.95	+53.2986	+0.2665	+23 47 50.62	+11.5970	-0.4282

## CATALOGUE OF THE PLEIADES.—Continued.

No.	Name.	Mag.	Right Ascension. 1873 <sup>o</sup> .	Precess.	Sec. Var.	Declination. 1873 <sup>o</sup> .	Precess.	Sec. Var.
26	<i>Anon.</i> 9	8.1	54 40' 47.74"	+53.2976	+0.2664	+23 47' 30.91"	+11.5944	—0.4282
27	<i>Merope</i> , 23 <i>d</i>	4.5	54 41' 51.64	+53.2167	+0.2642	+23 33' 1.73	+11.5893	—0.4277
28	<i>Anon.</i> 10	8.0	54 43' 33.21	+53.3240	+0.2668	+23 51' 27.21	+11.5812	—0.4287
29		8.4	54 45' 44.41	+53.1127	+0.2609	+23 13' 36.78	+11.5708	—0.4272
30	<i>Anon.</i> 11	9.1	54 46' 40.23	+53.2769	+0.2652	+23 42' 22.76	+11.5664	—0.4286
31	<i>Anon.</i> 12	7.5	54 51' 22.32	+53.4271	+0.2686	+24 7' 26.62	+11.5440	—0.4301
32		8.4	54 52' 11.31	+53.5314	+0.2712	+24 25' 25.84	+11.5401	—0.4310
33	<i>Anon.</i> 13	8.5	54 52' 56.86	+53.2497	+0.2638	+23 35' 57.39	+11.5365	—0.4289
34		9.2	54 54' 12.21	+53.3480	+0.2662	+23 52' 51.93	+11.5304	—0.4298
35	<i>Anon.</i> 14	9.0	54 54' 36.17	+53.1793	+0.2617	+23 23' 6.02	+11.5287	—0.4285
36	<i>Anon.</i> 15	8.5	54 55' 56.01	+53.2997	+0.2647	+23 43' 58.60	+11.5222	—0.4296
37	<i>Anon.</i> 17	7.9	54 56' 29.60	+53.1634	+0.2611	+23 19' 50.66	+11.5196	—0.4285
38	<i>Anon.</i> 18	8.0	54 56' 37.21	+53.3045	+0.2648	+23 44' 37.88	+11.5180	—0.4297
39	24 <i>p</i>	8.0	54 57' 3.47	+53.2973	+0.2646	+23 43' 15.84	+11.5168	—0.4296
40	<i>Anon.</i> 19	7.5	54 57' 16.20	+53.1906	+0.2617	+23 24' 29.13	+11.5159	—0.4288
41	<i>Anon.</i> 20	8.0	54 57' 28.05	+53.4599	+0.2688	+24 11' 35.97	+11.5149	—0.4309
42	<i>Anon.</i> 22	7.0	54 58' 2.77	+53.2301	+0.2627	+23 31' 10.14	+11.5121	—0.4292
43	<i>Anon.</i> 21	8.6	54 58' 4.82	+53.4844	+0.2694	+24 15' 43.88	+11.5120	—0.4312
44	<i>Anon.</i> 23	8.0	54 58' 48.81	+53.1509	+0.2604	+23 17' 0.27	+11.5085	—0.4287
45	<i>Anon.</i> 24	7.0	54 59' 2.13	+53.3593	+0.2660	+23 53' 37.12	+11.5074	—0.4303
46	<i>Alcyone</i> , 25 <i>n</i>	3.0	54 59' 4.68	+53.2965	+0.2643	+23 42' 36.86	+11.5073	—0.4298
47	<i>Anon.</i> 25	8.2	55 1' 18.69	+53.1311	+0.2597	+23 12' 54.37	+11.4966	—0.4287
48	<i>Anon.</i> 26	9.0	55 2' 46.50	+53.1107	+0.2589	+23 8' 55.73	+11.4894	—0.4287
49		9.4	55 5' 2.50	+53.2493	+0.2625	+23 32' 51.07	+11.4790	—0.4300
50		7.0	55 7' 52.11	+53.6146	+0.2707	+24 35' 40.02	+11.4653	—0.4331

## CATALOGUE OF THE PLEIADES.—Concluded.

No.	Name.	Magn.	Right Ascension. 1873.0.	Precess.	Sec. Var.	Declination. 1873.0.	Precess.	Sec. Var.
51	Anon. 27 Anon. 28 Anon. 29	9.2	55° 8' 32.64"	+53.3233	+0.2640	+23° 44' 55.58"	+11.4620	—0.4308
52		8.5	55 10 0.30	+53.3865	+0.2656	+23 55 31.90	+11.4551	—0.4313
53		7.0	55 12 27.64	+53.0838	+0.2571	+23 1 43.26	+11.4432	—0.4293
54		7.8	55 14 6.36	+53.4020	+0.2654	+23 57 11.64	+11.4354	—0.4320
55		9.0	55 15 24.12	+53.3457	+0.2638	+23 47 20.90	+11.4294	—0.4335
56	26 s Atlas, 27 f Pleiæ, 28 h Anon. 30	8.5	55 18 19.57	+53.0377	+0.2556	+22 52' 5.65"	+11.4151	—0.4293
57		7.0	55 21 5.05	+53.2451	+0.2605	+23 27 59.11	+11.4017	—0.4312
58		4.0	55 24 12.38	+53.3170	+0.2620	+23 39 46.01	+11.3869	—0.4321
59		6.2	55 24 30.33	+53.3461	+0.2627	+23 44 46.43	+11.3855	—0.4324
60		8.4	55 24 55.66	+53.2611	+0.2605	+23 29 46.77	+11.3834	—0.4317
61	Anon. 31 Anon. 32 Anon. 33	9.0	55 25 22.64	+53.0972	+0.2564	+23° 0' 56.13"	+11.3810	—0.4304
62		8.0	55 25 42.34	+53.4372	+0.2650	+24 0 20.83	+11.3797	—0.4332
63		7.5	55 26 57.27	+53.4340	+0.2647	+23 59 27.03	+11.3737	—0.4337
64		7.8	55 28 6.02	+53.3897	+0.2637	+23 51 28.01	+11.3682	—0.4331
65		8.7	55 30 24.80	+53.0964	+0.2559	+22 59 27.55	+11.3569	—0.4308
66	Anon. 34 Anon. 36 Anon. 37	8.4	55 32 28.99	+53.0857	+0.2555	+22 57' 8.65"	+11.3470	—0.4309
67		7.2	55 32 52.18	+53.2128	+0.2583	+23 19 21.80	+11.3452	—0.4321
68		8.5	55 35 19.00	+53.3904	+0.2627	+23 49 42.34	+11.3335	—0.4336
69		7.9	55 35 39.49	+53.4363	+0.2638	+23 57 37.19	+11.3318	—0.4340
70		9.4	55 36 7.48	+53.2998	+0.2604	+23 33 49.57	+11.3295	—0.4330
71	Anon. 38 Anon. 39 Anon. 40	7.5	55 36 23.34	+53.2649	+0.2595	+23 27' 36.60"	+11.3283	—0.4327
72		9.0	55 40 13.12	+53.5530	+0.2603	+24 16 39.55	+11.3098	—0.4353
73		7.7	55 43 23.09	+53.4985	+0.2646	+24 6 26.35	+11.2946	—0.4352
74		7.3	55 49 51.23	+53.3238	+0.2593	+23 34 30.81	+11.2634	—0.4343
75		8.9	55 58 6.64	+53.5291	+0.2635	+24 8 2.00	+11.2235	—0.4367

## IX.

## DISCUSSION OF RESULTS.

IT is of great interest to compare the photographic places of the various stars with those resulting from the Yale and Königsberg heliometer measures. This has accordingly been done, and the results are given in tabular form at the end of the present section. The first two columns of the table contain the number, and Besselian designation of the star. The rest of the table is divided into two parts, the first of which relates to the right ascensions. The column headed *Yale* contains the value of this co-ordinate, as given by the Yale\* heliometer measures, and referred to the equator and equinox of 1873.0. The next column, headed *N. Y.*, gives the seconds of right ascension, as contained in the photographic catalogue at the end of Section VIII. The next column, headed *Y. — N. Y.*, contains the direct differences of the last two columns. This is followed by the values of .27 (*Y. — K.*), or .27 (*Yale — Königsberg*), which would be equal to *Y. — N. Y.*, if no discordance existed between the photographic and heliometer results.† The next column, headed *Diff.*, gives the amount of such discordance. The numbers in this column show that the photographic results are of the highest accuracy. In fact, they compare very favorably with the heliometer residuals, which are set down in the last column,

\* In using ELKIN's table of *final results of the Yale measurements*, the following *errata* have been corrected :

Star No. 38, 24 p,	Declination should be 33".50.
" " 58, <i>Anon.</i> 31,	Precession in R. A. should be +53".4690.
" " 66, <i>Anon.</i> 38,	Declination should be 23° 29' 52".39.
" " 66	Precession in R. A. should be +53".2960.
" " 66	Sec. Var. in R. A. should be +0".2591.

The *errata* for Nos. 38 and 66 have been kindly communicated by Dr. Elkin.

† The Königsberg measures are given by BESSEL for 1840. The Yale measures are referred to 1885. The New York measures of 1873 should therefore differ from Yale by  $\frac{12}{45}$ , or .27 (*Y. — K.*).



headed *Hel'r*. The numbers in this column are the direct differences of the two triangulations executed by ELKIN at Yale; and it is quite plain from them that the photographic observations agree with those of the heliometer, about as well as do the latter *inter se*. The part of the table relating to declinations furnishes equally satisfactory results. We may therefore conclude that the present photographic observations are entitled to be taken into consideration, if it be desired to make a study of proper motions, or to form a definitive catalogue of the Pleiades.

It has not appeared desirable to compare directly the photographic and heliometer values of the distances and position angles. For the use of a different star as the origin of measurement in the two cases would lead to differences of considerable magnitude, and might tend to make the results of a comparison misleading. Moreover, the comparison of right ascensions and declinations given here shows that the rather large systematic errors in position angle found by ELKIN,\* upon examining GOULD'S results from the *earlier* RUTHERFURD photographs, do not appear in the present case. In fact, there is no very apparent reason why the method of orientation adopted by RUTHERFURD should lead to erroneous results.

The probable errors of the distances and position angles for the various stars are given in the table of Section VII.: the corresponding ones for the resulting right ascensions and declinations may easily be computed. If we let:

$r_s$  and  $r_p$  be the probable errors of distance and position angle, the latter being taken in arc of a great circle.

then we have for  $\delta' - \delta$ :

Probable error of  $\delta' - \delta = \sqrt{\cos^2 \pi r_s^2 + \sin^2 \pi r_p^2}$   
and for  $\cos \delta (\alpha' - \alpha)$ :

Probable error of  $\cos \delta (\alpha' - \alpha) = \sqrt{\sin^2 \pi r_s^2 + \cos^2 \pi r_p^2}$ .

It does not seem worth while to make a table of probable errors computed in this way for the several stars. But it will be of interest to set down the mean values. The average probable error, according to the table in Section VII. may be taken as:

$\pm 0''.04$  for the distances,  
 $\pm 0''.06$  for the position angles.

The average value of  $\sin^2 \pi$  is  $\frac{1}{2}$ , and that of  $\cos^2 \pi$  also  $\frac{1}{2}$ : so

\* *Astronomical Journal*, No. 197, p. 33.

that we have the following average probable errors:  
for the declinations:

$$\sqrt{\frac{1}{2} [".04]^2 + \frac{1}{2} [".06]^2} = \pm 0''.05$$

for the right ascensions:

$$\sec \delta \sqrt{\frac{1}{2} [".04]^2 + \frac{1}{2} [".06]^2} = \pm 0''.06.$$

These are the *average* probable errors of the co-ordinates given in the final catalogue of Section VIII., so far as they can be derived from the internal agreement of the measures upon the various plates. They show that extremely little harm has been done by the sources of error peculiar to each plate, which would tend to make the results from the separate plates disagree. Among these sources of error may be mentioned irregular distortion of the films, peculiar imperfections of the photographic images, and possible varying obliquity in the mounting of the plates, with respect to the optical axis of the telescope. The *actual* probable errors of the final co-ordinates are of course larger than those just given, since they involve also the remaining uncertainty of the scale value, as well as certain other possible sources of error. There does not seem to be any very marked difference in the probable errors for the stars of various magnitudes. That the probable errors of the position angles exceed those of the distances, may be due to the more *absolute* character of the former (see also Section VI.). It should perhaps be mentioned that every observation contained in the RUTHERFURD observation books has been employed in the reductions; with the exception of one, which was found to be erroneous upon comparison with the original negatives.

In conclusion, acknowledgment is made, on the part of Mr. Rutherford, to Miss Ida C. Martin, who executed the measures under his direction. Mr. D. C. Chapman was Mr. Rutherford's observatory assistant during the period of the Pleiades observations.

## COMPARISON WITH HELIOMETER RESULTS.

		Right Ascension.					Declination.						
No.	Name.	Yale, 1873-o.	N. Y.	Y. - N.Y.	(Y. - K.)	Diff.	Hel'r.	Yale, 1873-o.	N. Y.	Y. - N.Y.	(Y. - K.)	Diff.	Hel'r.
6	<i>g</i>	54 18' 50.82	51.02	-20	-02	-18	"	23 53' 16.06	16.19	-13	+04	-17	"
7	<i>b</i>	54 20 3.25	3.09	+16	+05	+11	T.09	23 42 42.81	42.74	+07	+12	-05	+04
11	18 <i>m</i>	54 23 48.42	49.04	-62	-14	-48	-07	24 26 18.40	18.34	+06	-04	+10	+15
12	19 <i>e</i>	54 24 46.06	46.32	-26	+03	-29	-28	24 3 59.63	59.83	-20	+01	-21	-07
15	A. 1	54 28 28.93	28.98	-05	-07	+02	-54	23 38 6.38	6.61	-23	-18	-05	-10
16	A. 2	54 30 14.42	14.82	-40	-14	-26	-26	24 3 48.89	49.11	-22	-26	+04	+51
17	A. 4	54 31 10.05	10.18	-13	-23	+10	-10	23 56 9.54	9.83	-29	-08	-21	-12
18	A. 5	54 31 32.54	32.46	+08	-08	+16	+18	24 13 39.82	39.81	+01	-28	+29	+14
19	A. 6	54 32 6.00	6.02	-02	-20	+18	-77	23 53 21.19	21.37	-18	-15	-03	-26
20	20 <i>c</i>	54 34 5.16	5.35	-19	+01	-20	-19	23 58 7.07	7.29	-22	-04	-18	-03
22	A. 7	54 34 50.08	49.91	+17	-05	+22	-29	23 38 23.45	23.69	-24	-20	-04	+11
23	<i>k</i>	54 35 9.88	10.09	-21	-03	-18	-33	24 9 20.21	20.44	-23	-05	-18	+13
24	22 <i>l</i>	54 37 17.21	17.25	-04	-03	-03	-43	24 7 45.54	45.72	-18	-02	-16	+38
25	A. 8	54 40 14.30	13.95	+35	-01	+36	-52	23 47 50.65	50.62	+03	+34	-31	-06
26	A. 9	54 40 47.97	47.74	+23	-13	+36	-61	23 47 30.71	30.91	-20	-05	-15	-18
27	<i>d</i>	54 41 51.93	51.64	+29	-05	+34	-09	23 33 2.03	1.73	+30	+04	+26	+17
28	A. 10	54 43 33.40	33.21	+19	-14	+33	-07	23 51 26.85	27.21	-36	-03	-33	+14
30	A. 11	54 46 40.59	40.23	+36	-19	+55	-59	23 42 22.75	22.76	-01	+05	-06	-05
31	A. 12	54 51 22.21	22.32	-11	-15	+04	-21	24 7 26.43	26.62	-19	+02	-21	-37
33	A. 13	54 52 57.14	56.86	+28	-09	+37	-01	23 35 57.85	57.39	+46	-04	+50	-44
35	A. 14	54 54 35.71	36.17	-46	-38	-08	+48	23 23 6.87	6.02	+85	+58	+27	-65
36	A. 15	54 55 56.08	56.01	+07	-16	+23	-45	23 43 58.39	58.60	-21	+09	-30	+01
37	A. 17	54 56 29.10	29.60	-50	-71	+21	+31	23 19 51.10	50.66	+44	+35	+09	-11
38	A. 18	54 56 37.38	37.21	+17	-10	+27	-26	23 44 37.58	37.88	-30	+04	-34	+27
40	A. 19	54 57 16.26	16.20	+06	+10	-04	-54	23 24 29.43	29.13	+30	-12	+42	-04

## COMPARISON WITH HELIOMETER RESULTS.—Continued.

No.	Name.	Right Ascension.					Declination.						
		Yale, 1873.o.	N. Y.	Y.—N.Y.	(Y.—K.) <sup>27</sup>	Diff.	Hel'r.	Yale, 1873.o.	N. Y.	Y.—N.Y.	(Y.—K.) <sup>27</sup>	Diff.	Hel'r.
41	A. 20	54 57 27.63	28.05	—42	—18	—24	+09	24 11 36.09	35.97	+12	+02	+10	+26
42	A. 22	54 58 2.88	2.77	+11	—01	+12	+06	23 31 10.53	10.14	+39	—03	+42	—10
43	A. 21	54 58 4.23	4.82	—59	—35	—24	—15	24 15 44.15	43.88	+27	+36	—09	+47
44	A. 23	54 58 49.03	48.81	+22	—02	+24	+51	23 17 0.24	0.27	—03	+05	—08	—12
45	A. 24	54 59 1.88	2.13	—25	—05	—20	+01	23 53 36.65	37.12	—47	—02	—45	+36
47	A. 25	55 1 19.02	18.69	+33	+44	—11	—35	23 12 54.08	54.37	—29	—21	—08	—21
48	A. 26	55 2 46.40	46.50	—10	—48	+38	+43	23 8 56.04	55.73	+31	+31	.00	—54
52	A. 27	55 9 59.88	0.30	—42	+02	—44	—31	23 55 31.50	31.90	—40	+07	—47	—06
53	A. 28	55 12 27.87	27.64	+23	.00	+23	+31	23 1 43.36	43.26	+10	+04	+06	+02
54	A. 29	55 14 6.19	6.36	—17	—02	—15	+13	23 57 11.25	11.64	—39	—02	—37	+02
57	26 s	55 21 5.34	5.05	+29	+28	+01	+11	23 27 59.14	59.11	+03	—22	+25	+21
58	f	55 24 11.88	12.38	—50	—02	—48	—13	23 39 46.24	46.01	+23	—06	+29	+17
59	h	55 24 29.99	30.33	—34	—03	—31	—34	23 44 46.67	46.43	+24	+01	+23	+22
60	A. 30	55 24 55.70	55.66	+04	—07	+11	—07	23 29 46.86	46.77	+09	—12	+21	—04
62	A. 31	55 25 41.97	42.34	—37	—15	—22	—08	24 0 20.99	20.83	+16	+10	+06	—13
63	A. 32	55 26 56.82	57.27	—45	—09	—36	+29	23 59 27.12	27.03	+09	—02	+11	—36
64	A. 33	55 28 5.82	6.02	—20	—11	—09	+23	23 51 28.09	28.01	+08	+06	+02	—31
67	A. 34	55 32 52.41	52.18	+23	+13	+10	—13	23 19 22.04	21.80	+24	+01	+25	—19
68	A. 36	55 35 18.20	19.00	—80	—51	—29	—78	23 49 42.19	42.34	—15	+32	—47	—41
69	A. 37	55 35 39.44	39.49	—05	—09	+04	+01	23 57 37.32	37.19	+13	+14	—01	—09
71	A. 38	55 36 23.23	23.34	—11	—14	+03	—19	23 27 36.77	36.60	+17	—01	+18	+31
73	A. 39	55 43 23.02	23.09	—07	+12	—19	—18	24 6 26.87	26.35	+52	—02	+54	+18
74	A. 40	55 49 51.31	51.23	+08	+03	+05		23 34 31.10	30.81	+29	+07	+22	



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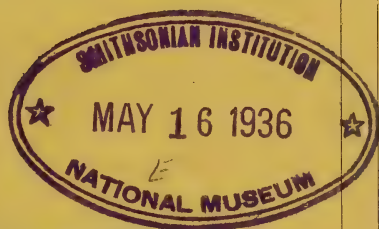
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# ANNALS

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V.—*The Rutherford Photographic Measures of the  
Stars about  $\beta$  Cygni.*

BY HAROLD JACOBY.

Read April 4, 1892.

THE group of stars surrounding  $\beta$  Cygni was frequently photographed by RUTHERFURD. Six of the plates were carefully measured under his direction with his improved micrometric apparatus provided with a glass *scale* for measuring the distances. The method of measurement was precisely the same as that employed in the case of the Pleiades plates, taken in 1872 and 1874,\* and but very few changes have been made in the method of reduction. The dates and other particulars connected with the several plates are collected in table I., at the end of the present paper. This table is similar to the one given† in my paper on the Pleiades, to which reference has just been made. The measures of distance have all been corrected for division errors, using the corrections determined by Professor Rogers for the RUTHERFURD scale.‡ No corrections for runs have been applied, as the microscope used for reading the scale was always kept very accurately adjusted.§

The measures of the Eastern and Western impressions upon the several plates have not been separately reduced, as in the case of the Pleiades reductions. It has been quite sufficient to take the means of the measures of the two impressions, and proceed with them as a single observation. Thus the computations are shortened, without becoming practically less rigid. Accordingly, the corrections for refraction given in table II., are the *means* of the refractions computed for the Eastern and Western impressions, with the data of table I. The refraction tables are similar in form to those used in the reduction of the Pleiades.||

\* The RUTHERFURD Photographic Measures of the Group of the Pleiades. *Annals N. Y. Acad. of Sciences*, vi, 1892, Feb.

† *Ann. N. Y. Acad.* vi, p. 241.

§ *Ibid.*, p. 251.

‡ *Ibid.*, p. 250.

|| *Ibid.*, p. 260.

The corrections for precession, etc., have been obtained by means of the usual formulæ,\* which for the present plates become:

$$\Delta p = [1.324] A + [n 9.615] B + [n 9.283] C + [9.689] D, \text{ for position angles.}$$

$$\Delta s = \{ [n 4.480] C + [n 4.195] D \} s, \text{ for distances.}$$

These corrections are additive to the observed quantities, and will reduce them to 1875.0. The numerical values are given in table III.

The "zero corrections" (table IV.) have been computed by the aid of the formula—†

$$v = \frac{1}{2} k z \tan \delta - y + x,$$

in which  $v$  is the zero correction which must be added to all the observed position angles of any plate. The significance of the other quantities entering into the formula may be found by referring to my paper on the Pleiades. The special corrections required by the position angles of the Western impressions in consequence of using the same zero point in measuring both impressions,‡ are also given in table IV. The last column of the table contains the final correction, as actually applied in the reductions. The scale value employed for all the observations is  $28''.0124$ , which is the mean of the scale values determined from all the Pleiades plates.§ The "tangent correction"|| has been applied to the distances expressed in divisions of the scale: for the distances were not transformed into arc, until after the final means had been taken. This was made possible by the use of a constant scale value instead of a separate value for each plate. The tangent corrections are contained in table IV. A.

It is customary in reducing micrometric observations, to eliminate partly the effect of casual variations of scale value, by assuming the distances of certain standard stars, and then using such a scale value for each plate as will make the sum of the standard distances come out equal to the assumed constant value. I adopted this method in reducing the Pleiades observations, using six standard stars.¶ Similar methods have been used by PRITCHARD and GILL in stellar parallax work,\*\* and by ELKIN in the heliometric triangulation of the Pleiades.†† But in the case of the present  $\beta$  Cygni

\* Ann. N. Y. Acad. vi, p. 267.

† Ibid., p. 272.

‡ Ibid., p. 278.

§ Ibid., p. 270.

|| Ibid., p. 276.

¶ Ibid., p. 270.

\*\* See GILL in Monthly Notices, Royal Astron. Soc., xlix, 3, p. 117.

†† Trans. Astr. Obs. of Yale University, vol. i, part i, p. 18.



plates it does not appear altogether necessary to adopt this process. The interval between the dates of the plates is not long enough to give a determination of parallax, even if it be desired to discuss the observations with that object in view. Moreover, I know of no reason for selecting as standard one set of distances rather than another. The alternative would be to correct the scale values so that the sum of *all* the distances on each plate would be equal to the mean value of that sum. But a little consideration shows that this would not change the final results.

I have therefore set down in table V. the results of the measures, in a form somewhat more condensed than that adopted for the Pleiades.\* It has appeared desirable to make it possible to return to the original observations at any time, and the numbers in the table are arranged in such a way that the separate observations of the Eastern and Western impressions may always be made available. The first two columns give the numbers of the star and plate. Then follow the observed distances, which are given in divisions of the glass scale. The numbers set down are the fractional part of the measured distance, the whole number of divisions being ordinarily the same as that given in the column *corrected mean*. Occasionally the corrections have been sufficient to change the whole number of divisions, in passing from the observed distance to the corrected mean. In that case we may expect that the number in the *observed distance* column will begin with a 9, while the fractional part of the *corrected mean* will begin with a 0. All the quantities given in the columns headed *observed* are taken without change from the observation books. The corrections for division error, which have been added to the observed values, are given in the next columns. They are expressed in units of the fourth decimal place. The *corrected mean* is obtained from the observed values by using the division error corrections as given, and applying further the tangent correction, and those for refraction and aberration. For the position angles I have given the observed value for the Eastern impressions, taken without change from the observation books. The last column gives the final corrected mean position angle. It is obvious that the observed values for the Western impressions can be reproduced from the two quantities given, by the aid of the corrections contained in tables II. and IV. It will be noticed that the

\* Compare Ann. N. Y. Acad., vi, p. 280, *et seq.*

observed position angles have received a correction of  $+270^\circ$ . This will make them conform to the usual way of counting from the North toward the point of greatest right ascension. Thus taking as an example star 38, plate 5, we have:

Corrected mean position angle . . . . .	111° 32' 43"
Refraction (table II.) with changed sign . . . . .	+ 11
Zero correction (table IV.) with changed sign . . . . .	— 8 52
Corr. of $+270^\circ$ , with changed sign . . . . .	—270 0 0
Mean of observed position angles . . . . .	201 24 2
Observed position angle East (table V.) . . . . .	201 23 23
Observed position angle West . . . . .	201 24 41

and in this way we can return to any of the observed position angles of the Western impressions.

Table VI. contains the final mean position angles, and the distances, reduced to seconds of arc by means of the scale value  $28''.0124$ . These are followed by the differences of right ascension and declination computed by means of the following formulæ:\*

$$\begin{aligned}
 n &= \sigma \sin \pi, & m &= \sigma \cos \pi, \\
 \alpha' - \alpha &= [0.052857] n + [4.4586] n m + [n 8.3872] n^3 + [9.2086] n m^2, \\
 \delta' - \delta &= m + [n 4.1047] n^2 + [n 8.8547] n^2 m.
 \end{aligned}$$

Table VIII. is a final catalogue of the RUTHERFURD stars, the position of  $\beta$  Cygni being given on the authority of AUWERS.† The magnitudes are ARGELANDER'S. The precessions and secular variations depend upon the constants of STRUVE,‡ and were computed with the aid of FOLIE'S tables.§

It would not be easy to arrive at any quite definite information as to the accuracy of the present measures. We have, of course, no certain knowledge that the scale value determined from the Pleiades remained unchanged up to 1875, when the  $\beta$  Cygni plates were made. Yet it is fair to assume that a value which held true during the whole period of Pleiades observations (1872, Jan. to 1874, Nov.) had not materially changed a few months later. It is therefore pertinent to inquire how nearly constant it remained during the

\* Ann. N. Y. Acad., vi, p. 317. † Publ. xiv, Astron. Gesellsch., p. 66.

‡ PETERS, Numerus Constans Nutationis, p. 195. Mém. de Saint-Petersbourg, 6<sup>e</sup> Série, t. iii, 1844.

§ Douze Tables pour le Calcul des Réductions Stellaires, Mém. Soc. Roy. des Sci. de Liege, t. x, 1883, supplément.

Pleiades period. The Pleiades scale value determinations were made for ten plates, and depend altogether upon a comparison with the Yale and Königsberg heliometer observations.\* The largest scale value obtained (Plate 16) is  $28''.0167$ , the smallest (Plate 25) is  $28''.0066$ . The mean is  $28''.0124$ ; and if we regard all the separate values as determinations of the same quantity with equal weight, the probable error is  $\pm 0''.00071$ , which corresponds to  $\pm 0''.025$  per 1000". The actual error may, of course, exceed this amount, but it seems only fair to conclude that the average uncertainty of the final  $\beta$  Cygni places does not exceed about  $0''.15$  on account of scale value. It must be remembered that all the observations were taken by the same observers, and under precisely the same instrumental conditions, as the Pleiades plates.

An examination of table V. tends to show that slight differences exist between the results obtained on the two observation dates of a nature different from those that would arise from variation of scale value. They appear to depend upon the position angle or direction of measurement. The proper motion of  $\beta$  Cygni, which is given by AUWERS as  $-0''.026$  in R.A., and  $-0''.020$  in declination would not account for them. If they depend upon a slightly varying inclination of the plate-holder, due perhaps to using the telescope at hour-angles of different sign, their effect would probably tend to disappear from the mean results. We may then finally conclude that the RUTHERFURD measures of the  $\beta$  Cygni stars furnish a catalogue of places of an accuracy sufficiently high to allow a determination of possible relative proper motion at no very distant date. It is to be hoped that such a determination will be undertaken.

Four of the stars in the RUTHERFURD list I have been unable to identify in ARGELANDER. These are:

No. 28	observed on 3 plates,
32	" " 1 plate,
33	" " 2 plates,
41	" " 2 plates.

I have examined the original negatives, and found the star images in question quite distinct. I also photographed the region 1892, April 19, and found numbers 32, 33, and 41 on the negatives. No. 28, which is quite close to No. 27 on the RUTHERFURD negatives, also appears on my plates, but only as a sort of elongation of No. 27.

\* Ann. N. Y. Acad., vi, p. 270.

On the other hand, several of ARGELANDER's stars are lacking on the plates. Thus we might certainly expect to find:

*B. D.* +27.3395 magnitude 8.8

+27.3414 " 9.0

+27.3417 " 9.0,

and perhaps also:

+27.3435 " 8.5

+28.3343 " 9.0.



TABLE I.—OBSERVATORY OF L. M. RUTHERFORD, NEW YORK.

Lat. =  $40^{\circ} 43' 48''.5$ , Long. =  $4^h 55^m 56^s.62$  W.

No.	Date.	Sidereal Time.	Bar.	Aft. Therm.	Ext. Therm.	Tel. Therm.	Focus.	Zero.	$\xi$	$\eta$	Log. $\kappa$ .
1 E.	1875 July 26	18 <sup>h</sup> 42 <sup>m</sup> 50 <sup>s</sup>	in. 30.10	75°	74°	76°	7.6	71.09	15.72	—31.31	6.4303
1 W.	1875 July 26	18 48 55	30.10	75	74	76	7.6		15.07	—27.75	6.4303
2 E.	1875 July 26	19 10 25	30.10	75	74	76	7.6	71.23	13.40	—12.57	6.4303
2 W.	1875 July 26	19 16 30	30.10	75	74	76	7.6		13.16	— 7.66	6.4303
3 E.	1875 July 26	19 35 40	30.10	75	74	76	7.6	71.03	13.18	+ 8.32	6.4303
3 W.	1875 July 26	19 41 45	30.10	75	74	76	7.6		13.45	+13.19	6.4303
4 E.	1875 Sept. 20	20 24 20	29.95	57	55	60	7.7	71.09	17.75	+38.99	6.4446
4 W.	1875 Sept. 20	20 30 25	29.95	57	55	60	7.7		18.62	+41.41	6.4445
5 E.	1875 Sept. 20	21 50 50	29.95	57	55	60	7.9	71.08	32.42	+56.76	6.4440
5 W.	1875 Sept. 20	21 56 55	29.95	57	55	60	7.9		33.55	+57.19	6.4440
6 E.	1875 Sept. 20	22 17 10	29.95	57	55	60	7.7	71.15	37.33	+58.20	6.4437
6 W.	1875 Sept. 20	22 23 15	29.95	57	55	60	7.7		38.47	+58.41	6.4437

TABLE II.—CORRECTIONS FOR REFRACTION.

Plate 1.			Plate 2.			Plate 3.		
<i>p.</i>	$\frac{\sigma-s}{s} \times 10^3$	$\pi-p.$	<i>p.</i>	$\frac{\sigma-s}{s} \times 10^3$	$\pi-p.$	<i>p.</i>	$\frac{\sigma-s}{s} \times 10^3$	$\pi-p.$
330°	+.290	0.0	350°	+.284	0.0	10°	+.284	0.0
340	.289	—0.8	0	.283	—0.5	20	.283	—0.5
350	.287	—1.4	10	.282	—1.0	30	.282	—1.0
0	.284	—1.9	20	.280	—1.4	40	.280	—1.4
10	.281	—2.2	30	.278	—1.6	50	.278	—1.6
20	.278	—2.2	40	.275	—1.6	60	.275	—1.6
30	.274	—1.9	50	.273	—1.4	70	.273	—1.4
40	.271	—1.4	60	.271	—1.0	80	.271	—1.0
50	.270	—0.8	70	.270	—0.5	90	.270	—0.5
60	.269	0.0	80	.269	0.0	100	.269	0.0
70	.270	+0.8	90	.270	+0.5	110	.270	+0.5
80	.271	+1.4	100	.271	+1.0	120	.271	+1.0
90	.274	+1.9	110	.273	+1.4	130	.273	+1.4
100	.278	+2.2	120	.275	+1.6	140	.275	+1.6
110	.281	+2.2	130	.278	+1.6	150	.278	+1.6
120	.284	+1.9	140	.280	+1.4	160	.280	+1.4
130	.287	+1.4	150	.282	+1.0	170	.282	+1.0
140	.289	+0.8	160	.283	+0.5	180	.283	+0.5
150	.290	0.0	170	.284	0.0	190	.284	0.0
160	.289	—0.8	180	.283	—0.5	200	.283	—0.5
170	.287	—1.4	190	.282	—1.0	210	.282	—1.0
180	.284	—1.9	200	.280	—1.4	220	.280	—1.4
190	.281	—2.2	210	.278	—1.6	230	.278	—1.6
200	.278	—2.2	220	.275	—1.6	240	.275	—1.6
210	.274	—1.9	230	.273	—1.4	250	.273	—1.4
220	.271	—1.4	240	.271	—1.0	260	.271	—1.0
230	.270	—0.8	250	.270	—0.5	270	.270	—0.5
240	.269	0.0	260	.269	0.0	280	.269	0.0
250	.270	+0.8	270	.270	+0.5	290	.270	+0.5
260	.271	+1.4	280	.271	+1.0	300	.271	+1.0
270	.274	+1.9	290	.273	+1.4	310	.273	+1.4
280	.278	+2.2	300	.275	+1.6	320	.275	+1.6
290	.281	+2.2	310	.278	+1.6	330	.278	+1.6
300	.284	+1.9	320	.280	+1.4	340	.280	+1.4
310	.287	+1.4	330	.282	+1.0	350	.282	+1.0
320	.289	+0.8	340	.283	+0.5	0	.283	+0.5

TABLE II.—CORRECTIONS FOR REFRACTION (*continued*).

Plate 4.			Plate 5.			Plate 6.		
$p$ .	$\frac{\sigma-s}{s} \times 10^3$ .	$\pi-p$ .	$p$ .	$\frac{\sigma-s}{s} \times 10^3$ .	$\pi-p$ .	$p$ .	$\frac{\sigma-s}{s} \times 10^3$ .	$\pi-p$ .
40°	+.308	0.0	57°	+.395	0.0	58°	+.446	0.0
50	.307	-1.0	67	.391	-4.2	68	.442	-6.0
60	.304	-2.0	77	.382	-7.8	78	.427	-11.1
70	.300	-2.7	87	.366	-10.4	88	.405	-15.1
80	.296	-3.1	97	.347	-11.9	98	.377	-17.1
90	.290	-3.1	107	.326	-11.9	108	.348	-17.1
100	.285	-2.7	117	.308	-10.4	118	.320	-15.1
110	.282	-2.0	127	.292	-7.8	128	.298	-11.1
120	.279	-1.0	137	.282	-4.2	138	.283	-6.0
130	.278	0.0	147	.278	0.0	148	.278	0.0
140	.279	+1.0	157	.282	+4.2	158	.283	+6.0
150	.282	+2.0	167	.292	+7.8	168	.298	+11.1
160	.285	+2.7	177	.308	+10.4	178	.320	+15.1
170	.290	+3.1	187	.326	+11.9	188	.348	+17.1
180	.296	+3.1	197	.347	+11.9	198	.377	+17.1
190	.300	+2.7	207	.366	+10.4	208	.405	+15.1
200	.304	+2.0	217	.382	+7.8	218	.427	+11.1
210	.307	+1.0	227	.391	+4.2	228	.442	+6.0
220	.308	0.0	237	.395	0.0	238	.446	0.0
230	.307	-1.0	247	.391	-4.2	248	.442	-6.0
240	.304	-2.0	257	.382	-7.8	258	.427	-11.1
250	.300	-2.7	267	.366	-10.4	268	.405	-15.1
260	.296	-3.1	277	.347	-11.9	278	.377	-17.1
270	.290	-3.1	287	.326	-11.9	288	.348	-17.1
280	.285	-2.7	297	.308	-10.4	298	.320	-15.1
290	.282	-2.0	307	.292	-7.8	308	.298	-11.1
300	.279	-1.0	317	.282	-4.2	318	.283	-6.0
310	.278	0.0	327	.278	0.0	328	.278	0.0
320	.279	+1.0	337	.282	+4.2	338	.283	+6.0
330	.282	+2.0	347	.292	+7.8	348	.298	+11.1
340	.285	+2.7	357	.308	+10.4	358	.320	+15.1
350	.290	+3.1	7	.326	+11.9	8	.348	+17.1
0	.296	+3.1	17	.347	+11.9	18	.377	+17.1
10	.300	+2.7	27	.366	+10.4	28	.405	+15.1
20	.304	+2.0	37	.382	+7.8	38	.427	+11.1
30	.307	+1.0	47	.391	+4.2	48	.442	+6.0

TABLE III.—CORRECTIONS FOR PRECESSION, ETC., TO 1875.0.

Plate.	Position Angle Correction.	Distance Factor $\times 10^3$ .
1	+ 4.3''	— .0048
2	+ 4.3	— .0048
3	+ 4.3	— .0048
4	+ 14.0	— .0554
5	+ 14.0	— .0554
6	+ 14.0	— .0554

TABLE IV.—ZERO CORRECTIONS.

Plate.	Zero Correction.		Special Corr'n, West.	Adopted Mean.
	East.	West.		
1	+8' 45''	+8' 45''	—30''	+8' 30''
2	+8 48	+8 48	—28	+8 34
3	+8 47	+8 48	—27	+8 34
4	+9 0	+9 0	—32	+8 44
5	+9 7	+9 8	—32	+8 52
6	+9 12	+9 14	—31	+8 58

TABLE IV. A.—TANGENT CORRECTION.

Distance.	Correction.
div.	div.
20	— .0000
25	.0001
30	.0002
35	.0003
40	.0004
45	.0006
50	.0008
55	.0010
60	.0013
65	.0017
70	.0021
75	.0026
80	.0032
85	.0038
90	.0045
95	.0053
100	.0062
105	.0071
110	.0081
115	.0093
120	.0106



TABLE V.—RESULTS OF THE MEASURES.

No.	Pl.	Observed Distance.		Division Errors.		Corrected Mean.	Position Angle.	
		East.	West.	East.	West.		E. Observed.	Mean, Corr'd.
1	4	9704	0042	+123	+ 85	111.0148	14° 10' 28"	284° 19' 19"
	5	9499	9978	123	92	.0071	10 30	19 19
					Means	111.0110		284 19 19
2	1	6682	6180	+124	+ 94	103.6751	0 17 33	270 26 4
	2	6550	6477	124	94	.6829	19 3	27 46
	3	6303	6327	124	94	.6631	18 43	27 27
	4	5864	6182	124	90	.6305	18 26	27 21
	5	5928	6184	124	90	.6410	17 53	26 54
	6	5851	5870	124	94	.6258	17 36	26 32
					Means	103.6531		270 27 1
3	1	8112	8370	+128	+112	100.8581	36 11 43	306 20 52
	2	8174	8286	128	112	.8561	13 53	22 36
	3	8204	8304	128	112	.8580	13 40	22 37
	4	8036	8186	128	112	.8392	13 27	22 16
	5	7900	8222	128	112	.8358	13 12	22 5
	6	8187	8158	128	112	.8477	12 48	21 53
					Means	100.8492		306 22 3
4	5	0110	0615	+106	+ 89	123.0624	49 59 15	320 8 19
5	2	2270	2288	+ 46	+ 29	126.2541	54 44 55	324 53 57
	3	1874	2014	46	29	.2201	45 26	54 16
	4	1854	2006	46	29	.2128	45 25	54 21
	5	1932	2033	46	29	.2179	44 58	54 6
	6	1786	2000	46	29	.2090	45 20	54 38
					Means	126.2228		324 54 16
6	1	5804	5850	+121	+110	70.6111	356 43 18	266 52 12
	2	5894	5944	121	110	.6151	45 15	53 39
	3	5892	5878	121	110	.6167	44 36	53 22
	4	5510	5652	121	107	.5841	44 20	53 3
	5	5556	5580	121	107	.5881	44 2	52 52
	6	5590	5404	121	110	.5840	43 46	52 49
					Means	70.5998		266 53 0
7	2	3972	4144	+117	+126	87.4373	320 41 17	230 50 44
	4	4040	3736	117	126	.4188	40 42	49 48
	5	4057	3731	117	126	.4269	41 0	50 6
	6	3889	3640	117	126	.4182	40 25	49 46
					Means	87.4253		230 50 6
8	1	6302	6166	+141	+119	98.6567	309 54 15	220 2 54
	2	6278	6236	141	118	.6593	55 43	4 16
	3	6222	6104	141	118	.6504	55 16	4 9
	4	5972	6181	141	119	.6396	54 10	3 8
	5	5956	5994	141	119	.6371	53 30	3 1
	6	5888	5831	141	119	.6301	53 8	2 34
					Means	98.6455		220 3 20

TABLE V.—RESULTS OF THE MEASURES (*continued*).

No.	Pl.	Observed Distance.		Division Errors.		Corrected Mean.	Position Angle.	
		East.	West.	East.	West.		E. Observed.	Mean, Corr'd.
9	1	0598	0570	+140	+127	91.0930	48° 37' 22"	318° 46' 4"
	2	0587	0528	140	127	.0895	38 34	47 31
	3	0488	0522	140	134	.0841	38 28	47 34
	4	0466	0676	140	127	.0861	38 24	47 35
	5	0497	0647	140	127	.0865	37 56	47 3
	6	0488	0434	140	127	.0755	37 45	47 9
				Means		91.0858		318 47 9
10	1	9080	9734	+ 46	+ 46	125.9689	63 49 25	333 58 24
	4	9375	9498	46	46	.9646	51 2	59 55
				Means		125.9668		333 59 10
11	1	0664	0650	+118	+ 94	46.0881	355 48 10	265 56 59
	2	0674	0740	118	94	.0929	50 17	58 44
	3	0599	0634	118	94	.0838	50 25	59 11
	4	0521	0552	118	89	.0743	49 36	58 21
	5	0458	0407	118	89	.0674	48 54	58 9
	6	0432	0372	118	94	.0665	49 13	58 2
				Means		46.0788		265 58 14
12	1	0755	0538	+102	+100	60.0895	310 25 58	220 34 38
	2	0592	0617	102	100	.0855	27 37	35 52
	3	0344	0666	102	100	.0758	25 38	34 37
	4	0248	0327	102	100	.0527	25 0	34 20
	5	0384	0221	102	100	.0590	24 42	34 4
	6	0374	0171	102	100	.0587	23 36	33 34
				Means		60.0702		220 34 31
13	1	8391	8612	+117	+107	40.8723	20 21 15	290 29 28
	2	8239	8361	117	107	.8518	23 35	32 26
	3	8484	8376	117	107	.8647	23 38	31 59
	4	8078	8149	117	99	.8311	24 52	33 17
	5	8094	8134	117	99	.8326	24 20	33 23
	6	8162	7945	117	99	.8274	23 36	32 47
				Means		40.8466		290 32 13
14	1	3462	3540	+135	+138	81.3826	290 32 4	200 40 46
	2	3386	3477	135	138	.3758	35 2	43 45
	3	3423	3457	135	138	.3768	34 25	42 47
	4	3306	3278	135	138	.3596	31 50	41 14
	6	3154	3216	135	138	.3556	30 38	40 15
				Means		81.3701		200 41 45
15	2	8618	8806	+128	+125	100.9056	77 45 12	347 53 59
	3	8600	8645	128	125	.8965	46 4	54 47
	4	8886	8980	128	125	.9232	45 2	53 59
	5	8913	8927	128	125	.9223	44 58	54 15
				Means		100.9119		347 54 15

TABLE V.—RESULTS OF THE MEASURES (*continued*).

No.	Pl.	Observed Distance.		Division Errors.		Corrected Mean.	Position Angle.	
		East.	West.	East.	West.		E. Observed.	Mean, Corr'd.
16	1	4654	4478	+136	+136	92.4910	273° 41' 8"	183° 50' 6"
	2	4587	4558	136	136	.4916	43 12	52 7
	3	4600	4554	136	136	.4921	42 26	51 29
	4	4465	4374	136	134	.4729	40 37	49 35
	5	4496	4352	136	134	.4755	40 28	49 41
	6	4301	4284	136	136	.4639	40 48	50 2
					Means	92.4812		183 50 30
17	1	5082	5225	+116	+115	41.5382	84 19 46	354 28 30
	2	5082	5164	116	115	.5350	21 2	29 24
	3	5146	5042	116	116	.5321	20 57	29 33
	4	5325	5204	116	115	.5475	21 26	30 5
	5	5272	5190	116	115	.5446	21 32	30 21
	6	5237	5215	116	115	.5445	22 37	31 38
					Means	41.5403		354 29 55
18	1	8988	8930	+106	+106	48.9195	86 47 37	356 56 22
	2	8925	8974	106	106	.9185	48 57	57 54
	3	8850	8820	106	106	.9070	48 46	57 37
	4	8952	8988	109	104	.9185	49 10	58 1
	5	8981	9034	109	104	.9230	48 17	57 42
	6	8954	9062	106	106	.9235	49 18	58 56
					Means	48.9183		356 57 45
20	1	2237	2292	+ 8	+ 7	1.2275	144 8 54	54 41 38
	2	2269	2392	2	7	.2338	144 53 47	54 18 39
	3	2395	2200	8	7	.2308	145 11 6	54 57 32
	4	2368	2310	8	7	.2348	144 55 18	55 5 43
	5	2348	2345	8	7	.2357	145 0 24	55 3 57
	6	2376	2442	8	7	.2419	144 59 22	55 12 45
					Means	1.2341		54 53 22
21.	2	1368	1640	+117	+117	47.1745	265 24 55	175 33 32
	4	1552	1486	113	118	.1739	20 12	29 7
	5	1598	1512	113	118	.1780	20 32	29 48
	6	1292	1348	117	118	.1554	21 30	30 12
					Means	47.1704		175 30 40
22	1	7326	7253	+126	+128	74.7598	93 2 0	3 10 10
	2	7052	7157	126	126	.7412	2 50	11 39
	3	7195	7124	126	126	.7468	2 36	11 24
	4	7258	7326	126	128	.7574	3 0	11 43
	5	7248	7452	126	128	.7649	3 2	11 48
	6	7402	7299	126	126	.7658	1 12	11 2
					Means	74.7560		3 11 18

TABLE V.—RESULTS OF THE MEASURES (*continued*).

No.	Pl.	Observed Distance.		Division Errors.		Corrected Mean.	Position Angle.	
		East.	West.	East.	West.		E. Observed.	Mean, Corr'd.
23	1	9855	9864	+133	+128	81.0185	261° 25' 4"	171° 34' 11"
	2	9824	9851	133	128	.0161	27 20	36 14
	3	9911	9817	133	128	.0185	26 17	35 16
	4	9793	9810	133	128	.0090	25 0	33 39
	5	9772	9730	133	128	.0047	24 46	33 37
	6	9752	9683	133	128	.0019	24 0	33 22
				Means		81.0114		171 34 23
24	4	5274	5409	+ 49	+ 68	13.5432	184 48 53	94 57 33
25	1	3797	3922	+122	+116	68.4146	103 3 40	13 11 57
	2	3872	3852	122	116	.4150	5 2	13 35
	3	3786	3825	122	116	.4095	5 30	14 6
	4	3886	3898	122	112	.4157	5 0	13 33
	5	3939	3928	122	112	.4224	5 2	14 2
	6	4010	4067	122	116	.4347	4 14	13 52
				Means		68.4186		13 13 31
26	1	6984	7078	+126	+128	99.7371	103 12 0	13 20 29
	2	6848	7072	126	128	.7301	13 12	22 1
	3	6894	6950	126	128	.7266	13 14	22 0
	4	6960	7100	126	128	.7341	12 30	21 40
	5	7096	7100	126	128	.7447	12 42	22 8
	6	7058	7117	126	128	.7459	12 18	21 45
				Means		99.7364		13 21 40
27	1	4753	4662	+ 99	+110	55.4948	135 8 2	45 16 50
	2	4724	4784	99	110	.4996	8 46	17 40
	3	4680	4582	99	110	.4876	9 38	18 26
	4	4883	4878	99	110	.5114	8 44	17 36
	5	4906	4880	99	110	.5176	8 5	17 31
	6	4786	4953	99	110	.5175	7 45	17 4
				Means		55.5048		45 17.31
28	2	6057	6136	+ 99	+112	55.6342	135 1 25	45 9 56
	3	6030	6200	99	112	.6362	0 30	9 34
	5	6332	6266	99	112	.6581	0 4	8 51
				Means		55.6428		45 9 27
29	2	7785	7883	+110	+116	67.8115	227 24 40	137 33 3
30	1	8830	8722	+110	+134	47.9021	186 13 8	96 21 29
	2	8509	8585	110	134	.8790	14 22	23 7
	3	8927	8725	110	134	.9068	13 44	22 37
	4	8974	9054	113	134	.9242	11 5	20 13
	5	8982	9051	113	134	.9274	11 38	20 30
	6	8950	9048	110	131	.9270	11 2	20 15
				Means		47.9111		96 21 22



TABLE V.—RESULTS OF THE MEASURES (*continued*).

No.	Pl.	Observed Distance.		Division Errors.		Corrected Mean.	Position Angle.	
		East.	West.	East.	West.		E. Observed.	Mean, Corr'd.
31	1	5558	5599	+126	+130	85.5912	234° 0' 54''	144° 9' 52''
	2	5604	5701	126	122	.5975	3 5	11 29
	3	5417	5548	126	122	.5800	2 34	11 10
	4	5797	5742	126	130	.6052	0 23	9 21
	6	5848	5800	126	130	.6106	0 27	9 20
				Means		85.5969		144 10 14
32	3	1668	1503	+123	+133	79.1893	211 11 20	121 20 4
33	3	1396	1298	+136	+146	98.1698	133 32 4	43 40 39
	5	1644	1296	141	146	.1886	31 0	39 42
				Means		98.1792		43 40 10
34	2	0504	0711	+ 17	+ 36	132.0854	121 11 5	31 19 42
	3	0394	0546	17	36	.0721	11 0	19 55
	4	0722	0777	17	50	.0974	10 42	19 33
	5	0860	0696	17	50	.1089	10 58	19 59
	6	0694	0712	17	36	.1060	10 4	19 42
				Means		132.0940		31 19 46
35	1	6682	6704	+126	+136	101.7047	226 36 36	136 45 23
	2	6582	6548	126	136	.6910	38 9	47 7
	3	6552	6702	126	136	.6966	38 2	46 54
	4	6861	6714	126	136	.7080	35 2	44 23
	5	6811	6812	126	136	.7107	35 26	44 29
	6	6640	6809	126	136	.7024	35 34	44 25
				Means		101.7022		136 45 27
36	1	9879	9888	+128	+150	100.0226	133 57 30	44 5 54
	2	9798	9884	128	150	.0187	58 18	6 46
	3	9738	9892	128	150	.0166	58 48	7 27
	4	0052	0076	128	150	.0394	57 38	6 20
	5	0060	0134	128	150	.0507	57 15	6 19
	6	9974	0000	128	150	.0445	56 38	6 13
				Means		100.0321		44 6 30
37	1	2454	2272	+140	+133	90.2708	216 30 45	126 39 46
	2	2359	2400	140	133	.2716	31 39	41 0
	3	2404	2390	140	133	.2730	32 48	41 17
				Means		90.2718		126 40 41
38	1	9052	8728	+123	+141	78.9210	201 24 46	111 33 32
	2	8818	8731	123	133	.9083	25 54	34 42
	3	8898	8792	123	133	.9151	25 54	34 37
	4	9067	8953	123	152	.9295	24 0	33 1
	5	9062	8961	123	152	.9324	23 23	32 43
	6	8861	9194	123	141	.9351	24 2	32 34
				Means		78.9236		111 33 32

TABLE V.—RESULTS OF THE MEASURES (*concluded*).

No.	Pl.	Observed Distance.		Division Errors.		Corrected Mean.	Position Angle.	
		East.	West.	East.	West.		E. Observed.	Mean, Corr'd.
39	2	2374	2364	+111	+130	104.2700	140° 13' 42"	50° 22' 3"
	3	2672	2450	111	130	.2897	14 12	22 26
	5	2786	2666	111	130	.3127	12 34	21 33
					Means	104.2908		50 22 1
40	3	3016	2816	+128	+150	100.3262	155 35 46	65 44 30
	6	3042	3300	128	158	.3640	34 35	43 23
					Means	100.3451		65 43 56
41	3	1382	1332	+128	+150	100.1701	163 46 45	73 55 15
	5	1739	1750	128	158	.2156	44 30	53 35
					Means	100.1928		73 54 25
42	1	3631	3629	+110	+120	114.3956	149 32 50	59 41 25
	2	3598	3504	110	120	.3879	34 32	43 7
	3	3625	3515	110	120	.3903	34 22	43 3
	4	3766	3704	110	120	.4043	32 55	41 44
	5	3769	3686	110	120	.4137	32 52	41 48
	6	3647	3776	110	120	.4179	32 4	41 20
					Means	114.4016		59 42 4

TABLE VI.—MEAN RESULTS.

No.	Mag.	Distance. 1875.0.	Position Angle. 1875.0.	$\alpha' - \alpha$ . 1875.0.	$\delta' - \delta$ . 1875.0.	Remarks.
1	9.3	3109.69	284° 19' 19"	-3409.62	+757.64	B.D.+27.3393
2	9.3	2903.58	270 27 1	-3279.40	+12.09	+27.3394
3	9.0	2825.03	306 22 3	-2580.23	+1668.49	+28.3344
4	9.2	3447.28	320 8 19	-2512.46	+2639.82	+28.3345
5	9.0	3535.80	324 54 16	-2313.14	+2887.62	+28.3347
6	8.2	1977.66	266 53 0	-2229.68	-112.48	+27.3397
7	9.2	2448.99	230 50 6	-2136.13	-1551.22	+27.3398
8	8.8	2763.29	220 3 20	-1997.72	-2119.05	+27.3400
9	8.7	2551.53	318 47 9	-1908.09	+1915.76	+28.3352
10	8.8	3528.63	333 59 10	-1762.27	+3168.04	+28.3353
11	8.0	1290.78	265 58 14	-1453.88	-92.81	+27.3404
12	9.0	1682.71	220 34 31	-1232.18	-1279.62	+27.3405
13	9.3	1144.21	290 32 13	-1211.41	+399.94	+27.3406
14	9.0	2279.37	200 41 45	-904.92	-2133.10	+27.3407
15	8.2	2826.78	347 54 15	-673.79	+2763.56	+28.3363
16	8.6	2590.62	183 50 30	-194.76	-2584.83	+26.3570
17	8.9	1163.65	354 29 55	-126.37	+1158.27	+27.3409
18	9.1	1370.32	356 57 45	-82.30	+1368.39	+28.3366
19	3.0					+27.3410
20	6.5	34.57	54 53 22	+31.94	+19.88	+27.3411
21	8.9	1321.35	175 30 40	+116.41	-1317.31	+27.3412
22	8.9	2094.10	3 11 18	+132.25	+2090.84	+28.3367
23	8.7	2269.32	171 34 23	+373.49	-2244.96	+27.3413
24	8.9	379.38	94 57 33	+426.84	-32.98	+27.3415
25	8.8	1916.57	13 13 31	+497.59	+1865.50	+28.3370
26	8.2	2793.86	13 21 40	+734.31	+2717.70	+28.3373
27	8.0	1554.82	45 17 31	+1251.52	+1092.25	+27.3421
28		1558.69	45 9 27	+1251.74	+1097.57	
29	8.8	1899.56	137 33 3	+1442.87	-1403.71	+27.3423
30	8.7	1342.10	96 21 22	+1505.90	-150.84	+27.3425
31	8.7	2397.77	144 10 14	+1577.49	-1946.51	+27.3426
32		2218.28	121 20 4	+2133.70	-1158.12	
33		2750.24	43 40 10	+2155.77	+1984.71	
34	8.8	3700.27	31 19 46	+2190.76	+3155.95	+28.3378
35	8.4	2848.92	136 45 27	+2192.83	-2080.11	+27.3428
36	8.9	2802.14	44 6 30	+2214.15	+2007.12	+28.3379
37	9.0	2528.73	126 40 41	+2281.78	-1515.65	+27.3429
38	8.5	2210.84	111 33 32	+2317.48	-817.75	+27.3430
39	9.4	2921.43	50 22 1	+2553.27	+1856.98	+28.3382
40	9.5	2810.90	65 43 56	+2902.68	+1146.87	+27.3433
41		2806.64	73 54 25	+3051.68	+768.71	
42	8.1	3204.65	59 42 4	+3137.94	+1606.95	+28.3392

TABLE VII.—CATALOGUE OF THE STARS ABOUT  $\beta$  CYGNI.

No.	Mag.	Right Ascension. 1875.0.	Prec.	Sec. Var.	Declination. 1875.0.	Prec.	Sec. Var.
1	9.3	290° 28' 23.04	+36.1325	+0.0161	+27° 54' 31.57	+7.0143	+0.3262
2	9.3	290 30 33.26	36.2216	.0159	27 42 6.02	.0262	.3269
3	9.0	290 42 12.43	36.0412	.0162	28 9 42.42	.0897	.3248
4	9.2	290 43 20.20	35.9285	.0162	28 25 53.75	.0960	.3237
5	9.0	290 46 39.52	35.9031	.0165	28 30 1.55	.1140	.3232
6	8.2	290 48 2.98	+36.2550	+0.0157	27 40 1.45	+7.1217	+0.3265
7	9.2	290 49 36.53	36.4228	.0156	27 16 2.71	.1301	.3279
8	8.8	290 51 54.94	36.4904	.0153	27 6 34.88	.1428	.3285
9	8.7	290 53 24.57	36.0247	.0162	28 13 49.69	.1508	.3241
10	8.8	290 55 50.39	35.8805	.0163	28 34 41.97	.1642	.3227
11	8.0	291 0 58.78	+36.2668	+0.0159	27 40 21.12	+7.1921	+0.3261
12	9.0	291 4 40.48	36.4077	.0156	27 20 34.31	.2123	.3272
13	9.3	291 5 1.25	36.2142	.0160	27 48 33.87	.2141	.3255
14	9.0	291 10 7.74	36.5116	.0154	27 6 20.83	.2419	.3279
15	8.2	291 13 58.87	35.9487	.0163	28 27 57.49	.2629	.3228
16	8.6	291 21 57.90	+36.5759	+0.0151	26 58 49.10	+7.3064	+0.3280
17	8.9	291 23 6.29	36.1464	.0160	28 1 12.20	.3125	.3241
18	9.1	291 23 50.36	36.1229	.0162	28 4 42.32	.3165	.3238
19	3.0	291 25 12.66	36.2829	.0157	27 41 53.93	.3238	.3252
20	6.5	291 25 44.60	36 2813	.0157	27 42 13.81	.3268	.3252
21	8.9	291 27 9.07	+36.4367	+0.0154	27 19 56.62	+7.3344	+0.3266
22	8.9	291 27 24.91	36.0428	.0163	28 16 44.77	.3359	.3230
23	8.7	291 31 26.15	36.5475	.0155	27 4 28.97	.3577	.3273
24	8.9	291 32 19.50	36.2947	.0159	27 41 20.95	.3626	.3251
25	8.8	291 33 30.25	36.0760	.0162	28 12 59.43	.3689	.3231
26	8.2	291 37 26.97	+35.9812	+0.0163	28 27 11.63	+7.3903	+0.3221
27	8.0	291 46 4.18	36.1803	.0160	28 0 6.18	.4371	.3236
28		291 46 4.40	36.1797	.0160	28 0 11.50	.4371	.3235
29	8.8	291 49 15.53	36.4711	.0155	27 18 30.22	.4543	.3260
30	8.7	291 50 18.56	36.3286	.0155	27 39 23.09	.4600	.3248
31	8.7	291 51 30.15	+36.5356	+0.0151	27 9 27.42	+7.4665	+0.3264
32		292 0 46.36	36.4560	.0155	27 22 35.81	.5166	.3254
33		292 1 8.43	36.0943	.0161	28 14 58.64	.5187	.3222
34	8.8	292 1 43.42	35 9585	.0163	28 34 29.88	.5218	.3208
35	8.4	292 1 45.49	36.5623	.0151	27 7 13.82	.5219	.3263
36	8.9	292 2 6.81	+36 0929	+0.0161	28 15 21.05	+7.5239	+0.3221
37	9.0	292 3 14.44	36.4997	.0153	27 16 38.28	.5300	.3257
38	8.5	292 3 50.14	36.4206	.0154	27 28 16.18	.5333	.3249
39	9.4	292 7 45.93	36.1169	.0161	28 12 50.91	.5544	.3220
40	9.5	292 13 35.34	36.2060	.0159	28 1 0.80	.5860	.3226
41		292 16 4.34	+36.2525	+0.0159	27 54 42.64	+7.5993	+0.3228
42	8.1	292 17 30.60	36.1574	.0161	28 8 40.88	.6070	.3220



VI.—*A Catalogue of the Fishes of the Pacific Coast of America  
North of Cerros Island.*

BY CARL H. EIGENMANN AND ROSA S. EIGENMANN.

Read May 9, 1892.

The present paper is an enumeration of the fishes occurring on the Pacific coast of America north of Cerros Island and to a depth of 150 fathoms. The explorations of the U. S. Fish Commission steamer Albatross, during the last three years, have added a large number of species to those previously known from this region, and our own explorations have added about as many new forms, from San Diego alone, as were discovered by the Albatross along the whole coast included in the present paper. These additions, as well as the extension of the habitat of many species, make the present list desirable.

Several forms have recently been discovered by the Albatross in deeper water. Most of these, however, have little relationship to the littoral fauna, and the deeper water has not been sufficiently explored to warrant a list at the present time.

We have placed the dividing line between the littoral and the bathybial faunas of this region at 150 fathoms, because all of the genera so far recorded from this depth have representatives in the shallower water—15 to 50 fathoms. Some of the littoral genera, as Sebastodes, have representatives in deeper water, but this is not of general occurrence; these are added as foot-notes.

Cerros Island is a convenient and natural southern boundary to this region. South of it few, if any, of the characteristic genera (Sebastodes, genera of Embiotocidæ) of this region are found. A number of southern forms extend further north, but this number has not been materially increased by our explorations at San Diego; on the other hand, a large number of northern forms, or representatives of northern forms which had not been found south of Point Conception, were added to the San Diego fauna. The California fauna has been hitherto divided into a southern and a northern at

Point Conception. This division was the result of insufficient exploration, and the results mentioned above have made it evident that no definite boundaries can be assigned for a Northern and a Southern California fauna.

It is quite evident, and readily admitted, that the fauna of California is distinct from the Alaskan fauna, and the latter has been added for convenience and comparison only. But four of the species found at San Diego are also found in Alaska. The California fauna is characterized by the abundance of species of *Sabastodes*, of *Cottidæ*, and of *Embiotocidæ*. The last are entirely absent from Alaska, while only a few species of *Sebastodes* are found there. The boundary between these two regions lies somewhere between Sitka and Puget Sound. No *Embiotocidæ* are found at Sitka.

The relative number of species at the principal localities is as follows:—

The whole of Alaska	. . . . .	108 species.
Puget Sound	. . . . .	107 "
San Francisco	. . . . .	156 "
Monterey	. . . . .	148 "
Santa Barbara	. . . . .	117 "
San Pedro	. . . . .	82 "
San Diego, including Cortes Banks	. . . . .	168 "

There are known from the entire region 382 species, belonging to 228 genera. Of these, 116 genera or more than half, are also found in the Atlantic Ocean, and 32 species are found both in the Atlantic and in the Pacific.

The genera having species in both oceans, practically all belong to one of three classes: 1st. Tropical genera; 2d. Arctic genera, whose species are distributed throughout the Arctic seas; 3d. Pelagic and other genera, having a wide distribution.

Lists similar to the present were published by Jordan and Gilbert in the Proceedings U. S. National Museum for 1880, for the shores from San Diego to Puget Sound, and by Bean (*l. c.*, 1881) for Alaska.

I have endeavored to give definite localities for the region from Ensenada, Lower California to Puget Sound. Those recorded from Alaskan waters have all been lumped into the general locality "Alaska." No definite localities have as yet been published for the species discovered by the Albatross.

[illegible]

	Ensenada.	San Diego.	Cortes Banks,	San Pedro.	Santa Barbara.	Port Harford,	Monterey.	San Francisco.	Columbia R.	Puget Sound.	Alaska.
52 <i>Plagyodus borealis</i> Gill . . . .										+	+
53 <i>Sudis borealis</i> Reinhardt . . . .										+	
54 <i>Sudis ringens</i> Jordan & Gilbert . . . .					+					+	
55 <i>Synodus lucioceps</i> Ayres . . . .		+			+		+				
56 <i>Tarletonbeania crenulare</i> Jordan & Gilbert					+						
57 <i>Tarletonbeania tenua</i> E. & E. . . .		+									
58 <i>Diaphus theta</i> E. & E. . . .		+									
59 <i>Catablemella brachychir</i> E. & E. . . .			+								
60 <i>Stenobranchius leucopsarum</i> E. & E. . . .		+									
61 <i>Myctophum californiense</i> E. & E. . . .			+								
62 <i>Myctophum townsendi</i> E. & E. . . .			+								
63 <i>Myctophum boops</i> Richardson <sup>1</sup> . . . .										+	
64 <i>Mallotus villosus</i> Müller . . . .											+
65 <i>Thaleichthys pacificus</i> Richardson . . . .									+	+	+
66 <i>Osmerus thaleichthys</i> Ayres . . . .						+	+			+	
67 <i>Osmerus dentex</i> Steindachner . . . .											+
68 <i>Hypomesus pretiosus</i> Girard . . . .								+		+	+
69 <i>Hypomesus olidus</i> Pallas . . . .										+	+
70 <i>Oncorhynchus gorboscha</i> Walbaum . . . .								+	+	+	+
71 <i>Oncorhynchus kisutch</i> Walbaum . . . .								+	+	+	+
72 <i>Oncorhynchus tshawytscha</i> Walbaum . . . .							+	+	+	+	+
73 <i>Oncorhynchus keta</i> Walbaum . . . .								+	+	+	+
74 <i>Oncorhynchus nerka</i> Walbaum . . . .									+	+	+
75 <i>Fundulus parvipinnis</i> Girard . . . .	+	+		+	+						
76 <i>Sidera mordax</i> Ayres . . . .	+	+		+							
77 <i>Ophichthys triserialis</i> Kaup . . . .								+			
78 <i>Myrichthys tigrinus</i> Girard . . . .									<sup>2</sup>		
79 <i>Nemichthys avocetta</i> Jordan & Gilbert . . . .										+	
80 <i>Ptilichthys goodei</i> Bean . . . .											+
81 <i>Tylosurus exilis</i> Girard . . . .		+		+	+						
82 <i>Scomberesox brevirostris</i> Peters . . . .		+					+				
83 <i>Hemirhamphus rosæ</i> Jordan & Gilbert . . . .		+		+							
84 <i>Exocætus californicus</i> Cooper . . . .		+	+	+	+						
85 <i>Siphostoma punctipinne</i> Gill . . . .		+									
86 <i>Siphostoma californiense</i> Storer . . . .		+			+	+	+	+		+	
87 <i>Siphostoma griseolineatum</i> Ayres . . . .							+	+		+	
88 <i>Siphostoma auliscus</i> Swain . . . .		+			+						
89 <i>Siphostoma barbaræ</i> Swain & Meek . . . .					+						
90 <i>Siphostoma leptorhynchum</i> Girard . . . .		+			+						
91 <i>Hippocampus ingens</i> Girard . . . .		+									
92 <i>Aulorhynchus flavidus</i> Gill . . . .		?					+	+		+	+
93 <i>Gasterosteus microcephalus</i> Girard . . . .	+	+		+		+	+	+		+	+
94 <i>Gasterosteus aculeatus cataphractus</i> Pallas . . . .								+		+	
95 <i>Mugil cephalus</i> Linnæus . . . .	+	+									
96 <i>Menidia tenuis</i> Ayres . . . .		+									
97 <i>Atherinopsis californiensis</i> Girard . . . .		+		+	+	+	+	+			
98 <i>Atherinops affinis</i> Ayres . . . .		+		+	+	+	+	+			

<sup>1</sup> *Myctophum protoculus* Gilbert, 584 f. (?) Described to us by fishermen.<sup>2</sup> Oregon, Adair Bay.



	Ensenada.	San Diego.	Cortes Banks.	San Pedro.	Santa Barbara.	Port Harford.	Monterey.	San Francisco.	Columbia R.	Puget Sound.	Alaska.
99 Sphyræna argentea Girard . . . . .	+	+		+	+		+	+			
? Polynemus approximans Lay & Bennett <sup>1</sup>											
100 Ammodytes personatus Girard . . . . .							+			+	+
101 Ammodytes alascanus Cope . . . . .											
102 Echeneis naucrates Linnæus . . . . .									+		
103 Remora remora Linnæus . . . . .		+	+						+		
104 Xiphias gladius Linnæus . . . . .			+	+				+			
? Trichiurus lepturus <sup>2</sup> . . . . .		+									
105 Scomber colias Gmelin . . . . .		+	+				+				
106 Scomberomorus maculatus . . . . .		+	+								
107 Scomberomorus concolor Lockington . . . . .							+				
108 Sarda chilensis C. & V. . . . .		+	+	+	+		+	+			
109 Germon alalonga Gmelin . . . . .		+	+	+	+		+				
110 Euthynnus pelamys Linnæus . . . . .		+									
111 Trachurus picturatus Bowdich . . . . .	+	+	+	+	+		+	+			
112 Caranx caballus . . . . .		+									
113 Seriola dorsalis Gill . . . . .	+	+	+	+	+						
114 Stromateus simillimus Ayres . . . . .		+			+	+	+	+		+	
115 Brama raji Bloch . . . . .							+	+		3	
116 Icosteus ænigmaticus Lockington . . . . .							+				
117 Ichthyos lockingtoni Jordan & Gilbert . . . . .							+				
118 Acrotus willoughbyi Bean . . . . .									4		
119 Paralabrax clathratus Girard . . . . .	+	+	+	+	+		+				
120 Paralabrax maculofasciatus Steindachner . . . . .		+									
121 Paralabrax nebulifer Girard . . . . .		+					+				
122 Steriolepis gigas Ayres . . . . .	+	+	+		+		+	+			
123 Xenistius californiensis Steindachner . . . . .		+									
124 Anisotremus davidsoni Steindachner . . . . .		+		+							
125 Girella nigricans Ayres . . . . .	+	+	+				+				
126 Cæsiosoma californiense Steindachner . . . . .		+		+	+		+	+			
127 Seriphus politus Ayres . . . . .				+	+	+	+	+			
128 Cynoscion parvipinne Ayres . . . . .	+	+		+	+						
129 Cynoscion nobile Ayres . . . . .		+		+	+		+	+			
130 Sciaena saturna Girard . . . . .		+		+	+						
131 Roncadore stearnsi Steindachner . . . . .	+	+		+	+						
132 Genyonemus lineatus Ayres . . . . .		+		+	+	+	+	+			
133 Umbrina roncadore Jordan & Gilbert . . . . .		+		+	+						
134 Menticirrhus undulatus Girard . . . . .		+		+	+						
135 Gerres cinereus Walbaum . . . . .		+									
136 Hysterocarpus traski Gibbons . . . . .								+			
137 Abeona minima Gibbons . . . . .		+		+	+	+	+	+			
138 Abeona aurora Jordan & Gilbert . . . . .							+	+			
139 Brachyistius frenatus Gill . . . . .	+		+	+			+	+		+	
140 Brachyistius rosaceus Jordan & Gilbert . . . . .							+	+			
141 Cymatogaster aggregatus Gibbons . . . . .	+		+	+	+	+	+	+		+	
142 Hyperprosopon analis A. Agassiz . . . . .					+	+					
143 Hyperprosopon argenteus Gibbons . . . . .		+	+	+	+	+	+	+			
144 Hyperprosopon agassizii Gill . . . . .	+			+	+	+	+	+			

<sup>1</sup> P. californiensis Thominit, California.<sup>2</sup> Described to us by fishermen.<sup>3</sup> Washington.<sup>4</sup> Damon, Washington.

	Ensenada.	San Diego.	Cortes Banks.	San Pedro.	Santa Barbara.	Port Harford.	Monterey.	San Francisco.	Columbia R.	Puget Sound.	Alaska.
145		+			+		+	+			
146		+		+		+	+	+			
147					+	+	+	+			
148		+		+	+	+	+	+			
149		+			+	+	+	+		+	
150											
151			+				+				
152		+		+	+	+	+	+			
153		+			+	+	+	+			
154		+		+	+	+	+	+			
155	+	+	+		+		+			+	
156		+		+							
157		+	+	+	+		+				
158	+	+		+	+						
159		+	+	+	+						
160		+									
161							+			+	
162											
163										+	+
164											+
165	+	+	+	+	+		+				
166		+									
167				+							
168		+		+	+			+		+	
169		+									
170		+									
171								+		+	
172				+				+		+	
173										+	
174		+								+	
175	+	+									
176											+
177											+
178								+	+		+
179											+
180								+	+		+
181								+	+		+
182		+	+		+	+	+	+		+	+
183								+		+	+
184			+							+	
185							+	+			
186							+			+	
187							+	+		+	+
188		+	+	+	+	+	+	+			
189		+					+	+			
190											
191		+	+	+			+	+			
192		+	+				+	+			
193							+	+		+	+

<sup>1</sup> Locality not definitely given.<sup>2</sup> Tomales Bay, Artesian well at Santa Monica.

	Ensenada.	San Diego.	Cortes Banks.	San Pedro.	Santa Barbara.	Port Harford.	Monterey.	San Francisco.	Columbia R.	Puget Sound.	Alaska.
194 <i>Sebastodes ciliatus</i> Tiles . . .										+	
195 <i>Sebastodes mystinus</i> J. & G. . .	+	+	+	+			+	+		+	
196 <i>Sebastodes entomelas</i> J. & G. . .						+	+	+			
197 <i>Sebastodes rufus</i> E. & E. . . .	+										
198 <i>Sebastodes ovalis</i> Ayres . . . .	+	+		+			+				
199 <i>Sebastodes proriger</i> Jordan & Gilbert	+						+	+			
200 <i>Sebastodes atrovirens</i> Jordan & Gilbert	+			+	+	+	+	+			
201 <i>Sebastodes pinniger</i> Gill . . . .	+						+	+		+	
202 <i>Sebastodes melanostomus</i> E. & E. . .	+						+	+			
203 <i>Sebastodes miniatus</i> Jordan & Gilbert	+	+	+	+	+	+	+	+			
204 <i>Sebastodes rupestris</i> Gilbert . . .											
205 <i>Sebastodes ruber</i> Ayres . . . . .	+	+		+			+	+		+	
206 <i>Sebastodes constellatus</i> Jordan & Gilbert	+	+		+			+	+			
207 <i>Sebastodes rosaceus</i> Girard . . . .	+	+		+			+	+			
208 <i>Sebastodes rhodochloris</i> Jordan & Gilb't							+	+			
209 <i>Sebastodes eos</i> E. & E. . . . .	+										
210 <i>Sebastodes umbrosus</i> J. & G. . . .				+							
211 <i>Sebastodes æreus</i> E. & E. . . . .	+										
212 <i>Sebastodes chlorostictus</i> J. & G. . .	+	+			+	+	+				
213 <i>Sebastodes gilli</i> E. . . . .	+										
214 <i>Sebastodes elongatus</i> Ayres . . . .	+	+					+	+			
215 <i>Sebastodes levis</i> E. & E. . . . .	+	+									
216 <i>Sebastodes rubrovinctus</i> Jordan & Gilb.	+	+		+			+				
217 <i>Sebastodes auriculatus</i> Girard . . .	+			+	+	+	+	+	+	+	
218 <i>Sebastodes rastrelliger</i> Jordan & Gilbert	+		+	+	+	+	+	+			
219 <i>Sebastodes caurinus</i> Richardson . .										+	+
220 <i>Sebastodes vexillaris</i> Jordan & Gilbert	+	+	+	+			+	+		+	+
221 <i>Sebastodes maliger</i> Jordan & Gilbert							+	+		+	+
222 <i>Sebastodes carnatus</i> Jordan & Gilbert	+		+	+	+		+	+			
223 <i>Sebastodes chrysomelas</i> Jordan & Gilb.	+		+	+	+		+	+			
224 <i>Sebastodes nebulosus</i> Ayres . . . .							+	+		+	
225 <i>Sebastodes serriceps</i> Jordan & Gilbert	+	+	+	+			+	+			
226 <i>Sebastodes nigrocinctus</i> Ayres . . .							+	+		+	
227 <i>Sebastodes zacentrus</i> Gilbert . . .				+							
228 <i>Sebastodes saxicola</i> Gilbert . . .				+							
229 <i>Sebastodes diploproa</i> Gilbert <sup>1</sup> . . .				+							
230 <i>Sebastodes sinensis</i> Gilbert, 870 ft. .				+							
231 <i>Sebastolobus alascanus</i> Bean, 960 ft. <sup>2</sup>											
232 <i>Synchirus gilli</i> Bean . . . . .										+	<sup>3</sup>
233 <i>Scorpena guttata</i> Girard . . . . .	+	+	+	+							
234 <i>Hemitripteris americanus cavifrons</i> Lockington											+
235 <i>Hemitripteris marmoratus</i> Bean . .											+
236 <i>Ascelichthys rhodorus</i> Jordan & Gilbert								+	<sup>4</sup>	+	+
237 <i>Psychrolutes paradoxus</i> Günther . .										+	+
238 <i>Artedius lateralis</i> Girard . . . . .							+	+		+	
239 <i>Artedius notospilotus</i> Girard . . .				+	+		+			+	+

<sup>1</sup> *Sebastodes aurora* Gilbert, 1600 ft.<sup>1</sup> *Sebastodes introniger* Gilbert, 1600 ft.<sup>2</sup> *Sebastolobus machrochir* Günther.<sup>3</sup> Barelay Sd., Brit. Columbia.<sup>4</sup> South to Cape Mendocino.

	Ensenada.	San Diego.	Cortes Banks.	San Pedro.	Santa Barbara.	Port Harford.	Monterey.	San Francisco.	Columbia R.	Puget Sound.	Alaska.
240 <i>Artedius fenestralis</i> Jordan & Gilbert										+	
241 <i>Dasycottus setiger</i> Bean, p. 42 . . .											+
242 <i>Icelus bicornis</i> Reinhardt . . . . .											+
243 <i>Icelinus australis</i> E. & E. . . . .			+								
244 <i>Icelinus quadriseriatus</i> Lockington . . .								+			
245 <i>Icelinus cavifrons</i> Gilbert, 44-30 f. . .					+						
246 <i>Icelinus filamentosus</i> Gilbert, 55-145 f. .					+						
247 <i>Icelinus tenuis</i> Gilbert, 45-150 f. . .					+						
248 <i>Icelinus fimbriatus</i> Gilbert, 36-145 f. .					+						
249 <i>Icelinus oculatus</i> Gilbert, 124 f. . . .					+						
250 <i>Chitonotus megacephalus</i> Lockington . .								+			
251 <i>Chitonotus pugetensis</i> Steindachner . .								+			
252 <i>Paricelinus hopliticus</i> E. & E. . . . .			+							+	
253 <i>Radulinus asprellus</i> Gilbert, 43-77 . . .									+		
254 <i>Gymnacanthus pistilliger</i> Pallas . . . .											+
255 <i>Gymnacanthus galeatus</i> Bean . . . . .											+
256 <i>Acanthocottus polyacanthocephalus</i> Pallas										+	+
257 <i>Acanthocottus tæniopterus</i> Kner . . . .										+	+
258 <i>Acanthocottus humilis</i> Bean . . . . .										+	+
259 <i>Acanthocottus axillaris</i> Gill . . . . .										+	+
260 <i>Acanthocottus platycephalus</i> Pallas . . .										+	+
261 <i>Acanthocottus verrucosus</i> Bean . . . . .										+	+
262 <i>Acanthocottus niger</i> Bean . . . . .										+	+
263 <i>Acanthocottus quadrifilis</i> Gill . . . . .										+	+
264 <i>Enophrys dicerans</i> Pallas . . . . .										+	+
265 <i>Enophrys bison</i> Girard . . . . .								+		+	+
266 <i>Liocottus hirundo</i> Girard . . . . .		+			+						
267 <i>Triglops pingeli</i> Reinhardt . . . . .										+	
268 <i>Prionistius macellus</i> Bean . . . . .											
269 <i>Leptocottus armatus</i> Girard . . . . .	+	+	+	+	+	+	+	+	+	+	
270 <i>Hemilepidotus spinosus</i> Ayres . . . . .								+	+		
271 <i>Hemilepidotus jordani</i> Bean . . . . .										+	+
272 <i>Hemilepidotus hemilepidotus</i> Tilesius .								+		+	+
273 <i>Melletes papilio</i> Bean . . . . .										+	+
274 <i>Scorpenichthys marmoratus</i> Ayres . . .		+	+		+	+	+	+	+	+	
275 <i>Oligocottus analis</i> Girard . . . . .	+	+		+			+	+	+	+	
276 <i>Oligocottus maculosus</i> Girard . . . . .						+	+	+	+	+	
277 <i>Oligocottus globiceps</i> Girard . . . . .						+	+	+	+	+	
278 <i>Blepsias cirrhosus</i> Pallas . . . . .							+	+	+	+	
279 <i>Blepsias bilobus</i> C. & V. . . . .								+	+	+	
280 <i>Nautichthys oculofasciatus</i> Girard . . .								+		+	+
281 <i>Rhamphocottus richardsoni</i> Günther . .					+					+	+
282 <i>Xenochirus triacanthus</i> Gilbert <sup>2</sup> . . .					+						
283 <i>Xenochirus latifrons</i> Gilbert, 61-158 .					+				+		
284 <i>Aspidophoroides inermis</i> Günther . . .								+	+		
285 <i>Aspidophoroides güntheri</i> Bean . . . .											+
286 <i>Siphaogonus barbatus</i> Steindachner . .											+

<sup>1</sup> No definite locality given.<sup>2</sup> *Bathyagonus nigrispinnis* Gilbert, 477 f.<sup>2</sup> *Xenochirus pentacanthus* Gilbert, 178 f.



	Ensenada.	San Diego.	Cortes Banks.	San Pedro.	Santa Barbara.	Port Harford.	Monterey.	San Francisco.	Columbia R.	Puget Sound.	Alaska.
287	Brachyopsis rostratus Tilesius . .									+	
288	Brachyopsis verrucosus Lockington .							+			
289	Brachyopsis xyosternus Jordan & Gilbert						+	+			
290	Bothragonus swani Steindachner . .									+	
291	Odontopyxis trispinosus Lockington .				+			+		+	
292	Podothecus vulsus Jordan & Gilbert .							+			
293	Podothecus acipenserinus Tilesius .									+	+
294	Prionotus stephanophrys Lockington							+			
295	Careproctus gelatinosus Pallas . .									+	
296	Cyclogaster pulchella Ayres . .						+	+		+	
297	Cyclogaster gibba Bean . . . .									+	+
298	Cyclogaster calliodon Pallas . . .									+	+
299	Cyclogaster cyclopus Günther . . .						+			+	+
300	Cyclogaster mucosa Ayres <sup>1</sup> . . . .						+	+			
301	Cyclopterichthys ventricosus Pallas .									+	
302	Cyclopterichthys stelleri Pallas . .									+	+
303	Eumicrotremus spinosus Müller . . .									+	+
304	Gobiesox mæandricus Girard . . . .						+	+		+	
305	Gobiesox rhessodon R. Smith . . . .	+	+								
306	Gobiesox eigenmanni Gilbert . . . .	+	+								
307	Porichthys margaritatus Richardson		+	+	+	+	+	+		+	
308	Trichodon trichodon Tilesius . . . .									+	
309	Trichodon japonicus Steindachner <sup>2</sup> .										
310	Cryptotrema corallinum Gilbert . . .				+						
311	Paroclinus rothrocki Bean. (Between Nagai and Koniuski Islands) . . . .								+		
312	Plectobranthus evides Gilbert . . . .										
313	Hypsoblennius gentilis Girard . . . .		+		+						
314	Hypsoblennius gilberti Jordan . . . .	+	+								
315	Neoclinus satiricus Girard . . . . .						+				
316	Neoclinus blanchardi Girard . . . . .		+		+	+	+				
317	Clinus evides Jordan & Gilbert . . . .	+	+		+	+	+				
318	Heterostichus rostratus Girard . . . .		+		+	+	+				
319	Auchenopterus integripinnis R. Smith		+								
320	Chirolophus polyactocephalus Pallas										+
321	Murænoides ornatus Girard . . . . .							+		+	+
322	Murænoides maxillaris Bean . . . . .									+	+
323	Murænoides dolichogaster Pallas . . .									+	+
324	Apodichthys flavidus Girard . . . . .							+	+	+	
325	Apodichthys fucorum Jordan & Gilbert						+	+	+	+	
326	Anoplarchus atropurpureus Kittlitz .						+	+	+	+	+
327	Xiphister chirus Jordan & Gilbert . .						+	+	+	+	+
328	Xiphister mucosus Girard . . . . .						+	+	+	+	+
329	Xiphister rupestris Jordan & Gilbert						+		+	+	+
330	Stichæus punctatus Reinhardt . . . .									+	+
331	Cebedichthys violaceus Girard . . . .	+	+		+	+		+			
332	Notogrammus rothrocki Bean . . . .									+	+
333	Lumpenus anguillaris Pallas . . . . .							+		+	+
334	Delolepis virgatus Bean . . . . .									+	+

<sup>1</sup> Paraliparis rosaceus Gilbert, 984 f.<sup>2</sup> (Gillellus semicinctus Gilbert) loc. ?  
(Gillellus arenicola Gilbert).<sup>3</sup> San Quentin.

	Ensenada.	San Diego.	Cortes Banks.	San Pedro.	Santa Barbara.	Port Harford.	Monterey.	San Francisco.	Columbia R.	Puget Sound.	Alaska.
335 Anarrhichas lepturus Bean . .							+	+			+
336 Anarrhichthys ocellatus Ayres . .							+	+		+	
337 Lycodopsis pacificus Collett . .							+	+		+	
338 Lycodopsis paucidens Lockington . .								+			
339 Lycodes coccineus Bean . .											+
340 Lycodalepis turneri Bean . .											+
341 Gymnelis viridis Fabricius . .											+
342 Scytaliscus cerdale Jordan & Gilb. ? Fierasfer dubius Putnam . .									+		
343 Otophidium taylori Girard . .	+	+			+		+	+			
344 Dinematchthys marginatus Ayres . .								+			
345 Gadus callarias Linnæus . .									+	+	
346 Pleurogadus navaga Kölreuter . .											
347 Microgadus proximus Girard . .							+	+		+	
348 Pallachius chalcogrammus Pallas . .					+		+	+		+	
349 Pallachius saida Lepechin . .									+	+	
350 Merlucius productus Ayres . .					+		+		+		
351 Macrurus acrolepis Bean . .											
352 Atheresthes stomias Jord. & Gilb. . .								+			+
353 Hippoglossus hippoglossus L. . .								+		+	
354 Lyopsetta exilis Jordan & Gilbert . .							+	+		+	
355 Eopsetta jordani Lockington . .	+						+	+		+	
356 Hippoglossoides elassodon J. & G. . .									+	+	
357 Psettichthys melanostictus Girard . .							+	+		+	
358 Hippoglossina stomata E. & E. . .	+										
359 Xystreurus liolepis Jordan & Gilb. . .	+	+	+	+							
360 Paralichthys californicus Ayres . .	+	+	+	+	+	+	+	+			
361 Citharichthys sordidus Girard . .	+	+				+	+	+	+		
362 Citharichthys stigmæus J. & G. . .			+	+				+			
363 Pleuronichthys decurrens J. & G. . .							+	+			
364 Pleuronichthys verticalis J. & G. . .							+	+			
365 Pleuronichthys cænopus Girard . .	+		+	+	+	+	+	+	+		
366 Hypsopsetta guttulata Girard . .	+		+	+	+		+	+			
367 Parophrys vetulus Girard . .				+			+	+			
368 Inopsetta ischyra Jordan & Gilbert . .									+	+	
369 Isopsetta isolepis Lockington . .								+	+	+	
370 Lepidopsetta bilineata Ayres . .							+	+			+
371 Lepidopsetta umbrosa Girard . .											
372 Limanda aspera Pallas . .											+
373 Pseudopleuronectes pinnifascia- tus Kner. . . . .											
374 Platessa quadrituberculata Pallas . .											+
375 Liopsetta glacialis Pallas . .											+
376 Platichthys stellatus Pallas . .						+	+	+	+	+	
377 Microstomus pacificus Lockington . .							+	+	+	+	
378 Symphurus atricauda J. & G. . .	+							+			
379 Sphæroides politus Girard . .	+										
380 Diodon hystrix Linnæus . .	+										
381 Chilomycterus californiensis E. . .			+								
382 Mola mola L. . . . .	+		+	+			+				
Totals . . . . .	27	158	51	82	117	49	149	156	25	106	109

## VII.—*Coleopterological Notices.*

### IV.

BY THOS. L. CASEY.

Read May 9, 1892.

The following pages are principally confined to studies in our Rhynchophora, taken up some time since for the sole purpose of distributing the nondescript material, forming a considerable part of my cabinet, with a measurable degree of scientific order and succession. As usual in such cases, the compass of the work gradually outgrew the limited and personal objects had in view at the beginning, and the investigations in several genera and groups became sufficiently advanced to suggest the propriety of publishing them, with the hope that they might prove useful to others similarly engaged.

There is but little further to state in way of introduction. The studies have been limited for the greater part to those groups which appeared to stand most in need of revision, either by reason of the large number of specific forms recently brought to light, especially by skillful collecting in our western country, or because of apparent misconception regarding generic identity, as in the case of the group Desmorhines of LeConte. This section of the Eriirhinini corresponds with the Smicronychina of the European fauna, where it is represented only by the genus *Smicronyx*, characterized by its connate tarsal ungues and the basal constriction of the rostrum. In our own fauna it is rather more abundant and diversified.

The Barini, or Baridiides, to which the greater part of the present paper is devoted, constitute probably the largest tribe of American Curculionidæ, and, in South America, form the most varied and characteristic element of the family, possibly excepting the Zygopini. It is interesting to note in this connection, that the recent researches of Mr. S. H. Scudder on the fossil beetle fauna of

several of our western Tertiary horizons seem to show that the relative importance of the Barini in America dates from somewhat remote geological epochs.

NEW YORK, May 9, 1892.

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## CURCULIONIDÆ.

### ERIRHININI.

#### **DORYTOMUS** Steph.

The separation of this genus from *Eirrhinus* is largely a matter of convenience, as the femoral teeth, constituting the principal distinguishing feature, are subject to great specific variations in development, sometimes being barely distinguishable even on the anterior femora, where they are generally most distinct. The genus presents also considerable diversity of structure, and a very noticeable lack of uniformity in the degree of sexual disparity, the three species of the first group having extremely marked sexual differences pervading the entire anterior portion of the body. In the second group, also consisting at present of three species, the sexual divergence is still strong, although much less marked and affecting only the beak and antennæ, while in the third and by far the largest section the sexual differences become very feeble.

In *Dorytomus* the body is oblong or oblong-oval, generally somewhat stout, more or less flattened above and frequently subinflated behind, strongly punctured, especially in the elytral striæ, and with pubescence which is composed usually of short robust decumbent hairs condensed in feebly defined spots, or, rarely, of scales similarly uneven in distribution, generally without, but occasionally with, erect bristling setæ in addition. The colors are usually rufo-testaceous in different degrees of intensity, rarely becoming piceous or black and more frequently paler ochreous or flavate. The tarsal claws are slender, divaricate, very strongly arcuate, swollen internally near the base but never distinctly toothed. Other structural characters will be referred to in the table given below.

The species are rather numerous, generally well characterized structurally but variable in coloration. They belong especially to the arctic fauna, extending southward in North America as far as



Arizona, and probably also throughout the elevated central region of Mexico.

The following tabular statement may possibly facilitate the identification of the greater part of those species at present known to collectors:—

- Anterior legs elongated in the male; beak long, slender, strongly, evenly arcuate at least in the female, the antennæ inserted near the middle in the latter sex; femoral teeth minute; species large and homologous with the European *longimanus*.....2
- Anterior legs not elongated in the male; beak long and slender, much longer and with the antennæ inserted at or near the middle in the female; species moderately large .....3
- Anterior legs not elongated in the male; beak shorter, stouter and more nearly straight, the antennæ inserted near apical third in the male and but slightly less apical in the female; species smaller.....4
- 2**—Elytra with long sparse erect and bristling setæ; beak in the female much longer than in the male; basal joint of the anterior tarsi extremely elongate in the latter sex.....1 **inæqualis**
- Elytra with short and more close-set erect setæ; beak not much longer in the female; basal joint of the anterior male tarsi subequal in length to the remainder.....2 **brevisetosus**
- Elytra devoid of erect setæ; beak only very slightly longer in the female; basal joint of the anterior male tarsi a little shorter than the remainder. 3 **mucidus**
- 3**—Anterior femur of the male with a rather small, very acute tooth.  
Body piceous-black, the antennæ rufous; elytra distinctly and gradually inflated behind.....4 **laticollis**
- Body much broader, pale ochreous-testaceous throughout, the sterna blackish; elytra subparallel.....5 **amplus**
- Anterior femur of the male with a large rectangular tooth; beak in that sex shorter and stouter; body dark rufo-testaceous, variegated with uneven darker spots.....6 **parvicollis**
- 4**—Elytra with erect bristling setæ .....5
- Elytra without erect setæ.....6
- 5**—Prothorax distinctly constricted behind the apex.  
Body generally dark in color; prothorax less transverse; elytral setæ sparse but long and conspicuous.....7 **hystricula**
- Body pale ochreous-flavate; prothorax short and strongly transverse; erect setæ more numerous and much shorter.....8 **hispidus**
- Prothorax not, or but just visibly and broadly constricted near the apex.  
Larger species, the prothorax rather large, strongly transverse and finely punctate; beak longer; erect setæ short and abundant, somewhat recurved.....9 **hirtus**
- Small species; prothorax small, coarsely punctate; beak very short, barely as long as the prothorax; erect setæ long, finer and sparser.

10 **filiolus**

- 6**—Vestiture generally coarse but hair-like, more or less condensed in uneven maculæ on the elytra .....7  
 Vestiture distinctly squamiform, dense, more or less condensed and variegated or marmorate on the elytra .....14  
**7**—Beak punctate but not at all sulcate or carinulate .....8  
 Beak punctate and with more or less distinct grooves and fine carinæ .....9  
**8**—Body black, densely clothed with gray pubescence...11 **mannerheimi**  
 Body pale rufo-testaceous, sparsely clothed with long white hairs; elytra with a triangular black basal cloud and a post-medial piceous spot, the latter divided by the suture .....12 **nubeculinus**  
**9**—Prothorax strongly constricted behind the apex, the latter more or less broadly subtubulate .....10  
 Prothorax not, or but very feebly constricted behind the apex .....11  
**10**—Coloration uniform or very nearly so throughout the upper surface.  
 Condensed pubescent areas of the elytra large and suffused.  
 Color rufo-testaceous.  
 Body less robust, darker, testaceous, more inflated behind, the beak longer and more slender, blackish, the eyes large and more approximate above .....13 **luridus**  
 Body larger, more robust and more parallel, paler and more flavate in color, the beak shorter, decidedly stouter, always pale, the eyes smaller .....14 **rufulus**  
 Color black; form narrow; beak rather long, somewhat more than one-half as long as the elytra in the female .....15 **cuneatulus**  
 Condensed pubescent areas very small and remote, each consisting of several longer white hairs; striae punctures very coarse .....16 **alaskanus**  
 Coloration not uniform; elytra with a more or less distinct and pale sublateral vitta.  
 Sutural notch triangular, deep and clearly limited, each elytron being acute and minutely subprominent at apex; condensations of the elytral vestiture almost obsolete .....17 **marginatus**  
 Sutural notch subobsolete, each elytron broadly rounded; elytral condensations well marked.  
 Pronotum with four small condensed spots in a posteriorly arcuate transverse line; head with a deep frontal fovea .....18 **indifferens**  
 Pronotum without trace of the four spots transversely arranged, but with two approximate, sparsely pubescent vittæ along the middle, and a lateral vitta, dilated at the middle and inclosing at this point a small subglabrous spot; frontal fovea obsolete .....19 **vagenotatus**  
**11**—Prothorax strongly transverse, with the apex much narrower than the base .....12  
 Prothorax small and but slightly transverse, the apex nearly as wide as the base .....13  
**12**—Coloration pale.  
 Small species, pale ochreous-testaceous throughout, with a broad indefinite and slightly darker subsutural vitta on each elytron, from the base nearly to the apex; punctuation coarse; vestiture rather long, coarse.

Larger species, broader, more depressed, pale ochreous-testaceous, the head and beak piceous-black, also with a feeble indefinite subsutural cloud on each elytron from before the middle nearly to the apex ...21 **fusciceps**  
Coloration dark.

Pronotum very coarsely, deeply punctate; coloration nearly uniform.

22 **brevicollis**

Pronotum finely, densely punctate, paler along the base and apex; each elytron with a blackish cloud in the middle toward base and another toward apex .....23 **subsignatus**

13—Beak pale, blackish toward apex.....24 **longulus**

14—Pronotum with a broad densely squamose vitta at each side.

25 **squamosus**

Pronotum with four median spots forming a transverse rectangle, the two anterior continued each feebly to the apex, the two posterior to the base, also with a small spot at each side between the rectangle and the lateral margin, the spots composed of long robust hairs; elytral vestiture squamiform and strongly marmorate .....26 **marmoreus**

There are two other species, apparently belonging to this genus and recently described by Dietz (Trans. Am. Ent. Soc., XVIII, pp. 262, 265)<sup>1</sup> under the names *Alycodes dubius* and *Elleschus angustatus*. I have not studied the types of these species, but *dubius* seems to be allied to the normal eastern forms such as *indifferens*; *angustatus* is almost certainly closely related to *squamosus*, a small narrow species, with the femoral teeth very small, the anterior alone distinct.

In regard to *Erirhinus lutulentus* and *rutilus* of Boheman, but little can be stated positively. The description of the latter seems to apply very well, however, to *Anthonomus nubilus* Lec., while *E. lutulentus* may possibly be the same as *Anchodemus angustus* Lec.

It is more than probable that the true affinities of *Elleschus* lie strongly in the direction of *Dorytomus*, and that the toothed claws form an exception of no more relative importance than the simple claws of certain of the *Anthonomini*. It will in fact be found

<sup>1</sup> It should be stated in passing, that the genus *Euclyptus* of Dietz (l. c. p. 271) seems to be identical with *Phyllotrox* Sch. This genus is widely distributed throughout North America and at least the northern part of South America, also in the intervening islands. To the nine species mentioned in the Munich Catalogue, should be added *nubifer* and *ferrugineus* Lec., and *testaceus* Dietz; there are several other species in my cabinet still undescribed. *Phyllotrox* is one of the characteristically American genera of true *Erirhinini*, and is decidedly out of place in the *Anthonomini*.

extremely difficult to maintain the Erirhinini, Anthonomini and Tychiini as satisfactory tribes, their limits being not at all well defined under the present scope. It would be more in accordance with natural affinities to unite them, and the resultant tribe might then be readily subdivided into numerous well-marked groups or subtribes.

1 **D. inæqualis** n. sp.—Oblong, slightly subcuneate, feebly convex; integuments black, obsoletely mottled with testaceous, especially laterally; vestiture rather dense but not altogether concealing the shining surface, somewhat fine, moderately long, subrecumbent, finely and confusedly mottled paler and darker, with numerous long erect and bristling setæ. *Head* with a large deep frontal fovea, the eyes large, feebly convex; beak long, equally, evenly and rather strongly arcuate throughout in both sexes, two-thirds longer than the prothorax, deeply punctate and longitudinally sulcate, with the antennæ inserted rather beyond apical two-fifths in the male, slightly more slender, very much longer, fully two-thirds as long as the body, cylindrical, finely but closely seriato-punctate, with the antennæ inserted at the middle in the female. *Prothorax* in the male large, transversely oval, fully as wide as the base of the elytra and more than one-third as long as the latter, in the female much smaller and more transverse, distinctly narrower than the base of the elytra and scarcely more than one-fourth as long as the latter; punctures rather coarse, deep, moderately dense. *Elytra* with the sides straight in basal two-thirds, nearly parallel in the male but feebly divergent from the humeri in the female, obtusely parabolic in apical third; striæ slightly impressed, the punctures coarse, very deep and approximate; intervals nearly flat, finely, not densely punctate. *Abdomen* finely and densely punctate. Length 5.4–6.5 mm.; width 2.3–2.8 mm.

California (Los Angeles).

The sexual differences in this species are more pronounced by far than in any other within our fauna. In the male the basal joint of the antennal funicle is but slightly longer than the next two, the anterior legs slender and very long, the femur and tibia each one-half as long as the entire body, the latter evenly, feebly arcuate and slightly spinulose along the inner margin, and the corresponding tarsi have the basal joint longer than the remainder and but slightly shorter than the prothorax, with the inner edge finely and unevenly serrulato-granulose. In the female the second joint of the funicle is slightly longer but not as long as the next three, and the anterior legs are normal, the tarsi stout, with the basal joint shorter than the remainder. This species has been confounded with *mucidus* heretofore, but differs greatly as may be judged by the description.



2 **D. brevisetosus** n. sp.—Oblong, very feebly convex above; integuments rather shining, piceous-black, confusedly mottled with rufous, especially toward the sides; vestiture rather dense, moderate in length, subrecumbent, confusedly mottled and with numerous very short erect setæ. *Head* very densely pubescent, especially above the eyes and with a deep frontal fovea; eyes large, feebly convex; beak in the male two-thirds longer than the prothorax, feebly arcuate, coarsely, deeply, rugosely punctate and longitudinally sulcate, with the antennæ inserted slightly beyond the middle, the basal joint of the antennal funicle as long as the next three; in the female the beak is a little more slender, evenly and strongly arcuate, much more than twice as long as the prothorax, smooth, more finely, sparsely punctate, with the antennæ inserted a little behind the middle, the basal joint of the funicle as long as the next four. *Prothorax* not coarsely, deeply, somewhat sparsely punctate, with an impunctate median line; in the male it is transversely oval, slightly narrower than the elytra and about one-third wider than long, in the female smaller, more transverse, more broadly truncate at apex, much narrower than the elytra and about one-half wider than long. *Elytra* three-fourths longer than wide, the sides straight and parallel in the male or feebly divergent from the base to apical third in the female, the apex obtusely rounded, the sutural notch rather large and distinct; striae puncture rather large, deep, closely approximate; intervals finely, somewhat distinctly and closely punctate. *Abdomen* rather strongly, not densely, unevenly punctate. Length 5.7–7.0 mm.; width 2.3–2.9 mm.

#### Arizona.

This species is closely related to *mucidus*, but may be distinguished by the slightly longer beak with the antennæ a trifle less apical in insertion in both sexes, by the abundant, erect but short setæ, bristling throughout the dorsal surface, and by the relatively more elongate anterior legs of the male, the basal joint of the tarsus in that sex being about equal in length to the remainder; it is distinctly shorter in *mucidus*.

3 **D. mucidus** Say.—Curc. 14, Ed. Lec., I, p. 277 (Erihrinus); Gyll.: Sch. Gen. Curc., III, p. 291; Lec.: Proc. Am. Phil. Soc., XV, p. 164.

Oblong, flat above, convex at the sides, somewhat densely clothed with short robust pointed and subrecumbent hairs, which are whitish in color and with barely a trace of sparse and extremely short semi-erect setæ toward apex only; integuments black and rufo-testaceous confusedly mottled. Beak slender in the male, feebly arcuate, coarsely, densely, rugosely striato-punctate, about one-half longer than the prothorax, with the antennæ inserted at apical two-fifths, in the female more strongly arcuate, cylindrical, smooth, finely, less densely, confusedly punctate, twice as long as the prothorax, with

the antennæ inserted at the middle; antennæ slender, with the basal joint of the funicle about as long as the next four together, the second as long as the next two, differing but slightly in the sexes. Prothorax larger and longer in the male than in the female, one-half wider than long and but slightly narrower than the elytra in the former, three-fourths wider than long and much narrower than the elytra in the latter; sides strongly arcuate, rounded and convergent but not at all constricted near the apex; disk strongly but not very coarsely punctate, the punctures distinctly separated. Elytra parallel, ogival toward apex, from two-thirds to three-fourths longer than wide, the strial punctures coarse, deep, moderately close-set, the intervals feebly convex, minutely, feebly, rather sparsely punctulate. Length 5.0–6.5 mm.; width 2.0–3.0 mm.

Canada, Indiana and Nebraska. The sexual differences are slightly less pronounced than in *brevisetosus* and very much less so than in *inæqualis*, and this species is readily distinguishable from both by the absence of erect setæ. In the male the anterior legs are elongated, but the basal joint of the tarsus is shorter than the remainder and about one-half as long as the prothorax.

4 **D. laticollis** Lec.—Proc. Am. Phil. Soc., XV, p. 164.

Piceous-black, variegated with small distant spots of rufo-piceous, polished, the vestiture sparse, consisting of short robust and recumbent hairs, condensed in numerous small paler spots and also toward the sides of the prothorax, without trace of erect setæ. Head strongly, not very densely punctate and with a deep frontal fovea; beak very slender, cylindrical, in the male strongly arcuate, straight toward base, rather finely but deeply, linearly punctate and fully one-half as long as the elytra, very finely, sparsely and inconspicuously setose, the antennæ inserted just behind apical third, the basal joint of the funicle fully equal to the next three. Prothorax small, transverse, three-fourths wider than long, the sides abruptly rounded and strongly convergent anteriorly, the apex very briefly tubulate and broadly arcuate, three-fourths as wide as the base; punctures deep, perforate but not very large, rather sparse, the median impunctate area very feebly defined toward the center only; apical margin rufescent. Elytra at base nearly one-third wider than the prothorax, almost four times as long, slightly wider behind the middle, broadly constricted behind the humeri, the strial punctures coarse, deep and close-set; intervals nearly flat, finely but strongly,

rather closely punctate. Abdomen finely, not very densely punctate. Length 4.4 mm.; width 1.9 mm.

The description is drawn from a male taken in Michigan. It also occurs at Lake Superior and in Iowa according to LeConte.

5 **D. amplius** n. sp.—Oblong, feebly convex, robust, strongly shining, pale brownish-flavate throughout; vestiture very sparse, consisting of small robust and recumbent hairs, feebly condensed in subtransverse wavy lines on the elytra behind, also denser at the humeri; erect setæ completely wanting. *Head* finely but deeply and rather densely punctate and setose, the frontal fovea small but deep; beak in the male slender, strongly arcuate, evenly cylindrical, finely but deeply, rather closely lineato-punctate, very slightly more than one-half as long as the elytra, with the antennæ inserted near apical two-fifths, first funicular joint as long as the next three, second equal to the following two combined. *Prothorax* small, transverse, nearly three-fourths wider than long, the sides subparallel and strongly, almost evenly arcuate, not very abruptly rounded near the apex but distinctly constricted, the apex truncate, very broadly tubulate, more than three-fourths as wide as the base; punctures rather fine but deep, quite sparse, the impunctate line narrow and not attaining the apex. *Elytra* at base nearly two-fifths wider than the prothorax, about four times as long as the latter and scarcely noticeably wider behind the middle, the sides gradually ogival in apical third, with the sutural notch rather large; humeri rectangular, rounded, broadly exposed; stria punctures rather small but very deep, perforate and close-set; intervals flat, very minutely feebly sparsely and inconspicuously punctate. *Abdomen* finely, distinctly, subrugosely punctate. Length 5.4 mm.; width 2.3 mm.

#### Colorado.

A rather large species allied to *laticollis* and *parvicollis*, but differing in its entirely pale reddish-ochreous coloration, and much broader form. The two specimens before me are apparently males.

6 **D. parvicollis** n. sp.—Oblong, moderately stout, feebly convex, shining, rufo-testaceous, irregularly mottled with piceous-black, especially toward the middle; vestiture rather sparse, consisting of short robust and recumbent pale hairs, unevenly and feebly condensed and mottled, without trace of erect setæ. *Head* finely, deeply, very densely punctured and with a deep frontal fovea; beak in the male somewhat stout, feebly but distinctly arcuate, coarsely deeply and closely punctate in longitudinal furrows, strongly and conspicuously setulose and slightly longer than the head and prothorax, distinctly less than one-half as long as the elytra, with the antennæ inserted just beyond apical two-fifths; in the female the beak is very long, slender, less sulcate, strongly, evenly arcuate, fully two-thirds as long as the elytra, with the antennæ inserted just beyond the middle; basal joint of the funicle sub-

equal to the next three in both sexes. *Prothorax* small, transverse, about two-thirds wider than long, nearly similar in the sexes, abruptly, strongly rounded and very strongly narrowed near the apex, the latter broadly and rather strongly tubulate, four-fifths as wide as the base, broadly, feebly arcuate, feebly sinuate in the middle; punctures not very coarse but deep, dense although distinctly separated, the impunctate line completely obsolete. *Elytra* at base from one-third to one-fourth wider than the prothorax, four times as long as the latter, parallel in the male but gradually distinctly wider behind in the female, obtusely ogival at apex; striae punctures moderately large, very deep, perforate, close-set; intervals nearly flat, minutely, feebly, rather sparsely punctate. *Abdomen* finely, evenly, not densely punctate. Length 4.5-5.5 mm.; width 2.0-2.2 mm.

#### Indiana.

Allied to *laticollis*, but distinguishable by the pale coloration and especially by the shorter, more robust beak of the male and the slightly larger eyes of the same sex; the beak and head are also much more coarsely and densely punctate and setose. The tooth of the anterior femur is larger in the present species than in *laticollis*, and the elytra are parallel in the male and not gradually feebly inflated behind.

**7 *D. hystricula*** n. sp.—Oblong-oval, convex, feebly shining, piceous-black and more or less rufescent toward the sides, to pale rufo-testaceous throughout; legs always pale; vestiture dense, consisting of short stout pointed and decumbent hairs, cinereous in color and but feebly mottled, the pronotum with two narrow indefinitely nubilate darker vittæ, the elytra bristling also with long erect stiff setæ, not close-set in a single line on each interval. *Head* and beak very densely punctate throughout, the latter not longitudinally carinulate or sulcate, in the male short, about as long as the prothorax, with the antennæ inserted at apical third, in the female just visibly longer, but not longer than the prothorax, with the antennæ inserted at apical two-fifths, in both sexes feebly, evenly arcuate and stout; antennæ stout, the basal joint of the funicle as long as the next three, second much shorter than the next two, outer joints gradually thicker and transversely oval, club thick, oval, pointed. *Prothorax* one-half wider than long, parallel and broadly arcuate at the sides, moderately constricted and broadly sub-tubulate at apex, the punctures not coarse but deep and dense; impunctate line obsolete. *Elytra* at base one-third wider than the prothorax, about three and one-half times as long as the latter, the sides parallel and nearly straight; apical third evenly ogival; sutural notch broad and rather large; striae unimpressed, the punctures moderately coarse, deep, somewhat close-set; intervals minutely, very feebly and somewhat closely punctate. *Abdomen* closely, rather coarsely, confusedly and subrugosely punctured. Length 2.7-3.3 mm.; width 1.1-1.5 mm.



California (San Francisco to Los Angeles).

One of the most abundant of the Californian species and represented before me by a large series. It varies greatly in color, and closely resembles *mannerheimi* Gemm.; the latter, however, completely lacks the long coarse erect setæ which are so conspicuous in *hystriacula*.

8 **D. hispidus** Lec.—Proc. Am. Phil. Soc., XV, p. 167.

Oblong, somewhat stout, convex, feebly shining, pale flavo-testaceous throughout except the sterna of the hind body, which, as in *hirtus*, are blackish; vestiture dense, consisting of robust recumbent hairs, feebly subdenuded in uneven wavy blotches on the elytra behind the middle, and with coarse erect bristles of moderate length. Head very densely punctate and coarsely pubescent, the beak in the female subglabrous toward apex, very feebly, evenly arcuate, rather slender, not quite as long as the head and prothorax, the antennæ inserted at apical two-fifths; between the bases of the antennæ there is a dilated flat polished and impunctate area. Prothorax small, more than one-half wider than long, parallel and rounded on the sides, convergent and sinuate, but not strongly constricted, near the apex, the latter three-fourths as wide as the base; punctures moderate in size, deep, dense, the impunctate line narrow and distinct. Elytra at base fully one-third wider than the prothorax, much more than three times as long, parallel, gradually, evenly parabolic in more than apical third; stria punctures moderately large, very deep and close-set; intervals about three times as wide as the punctures. Abdomen densely, rugosely punctate. Legs short. Length 3.6 mm.; width 1.4 mm.

New Mexico. Cab. LeConte. A distinct species not closely allied to any other; it differs from *hirtus* in its smaller, narrower prothorax, and the shorter and sparser pubescence of the elytra, although the erect setæ are similar to those of that species in length and abundance; also, as remarked by Dr. LeConte, in the absence of the interantennal sulcus.

9 **D. hirtus** Lec.—Proc. Am. Phil. Soc., XV, p. 166.

Oblong, robust, convex, somewhat shining, pale flavo-testaceous, the beak piceous; sterna and their parapleuræ black; vestiture dense, consisting of long robust recumbent hairs, yellowish-white in color, scarcely mottled but subdenuded in a large clouded spot

near the middle of each elytron; elytra and beak toward apex bristling with stiff suberect setæ. Beak in the female not very stout, evenly, feebly arcuate, as long as the head and prothorax, rather sparsely punctate and subglabrous except above in basal half, with an elongate indentation between the antennæ, the latter inserted just behind apical third, the basal joint of the funicle not quite as long as the next three; club moderate, not darker in color. Prothorax two-thirds wider than long, parallel and rounded at the sides, convergent and just visibly constricted anteriorly, the apex nearly three-fourths as wide as the base; disk rather finely, somewhat closely punctate, without distinct impunctate line. Elytra at base barely one-fourth wider than the prothorax, three and one-half times longer than the latter, subparallel, ogival in apical third, the striæ feebly impressed, the punctures rather small, not very close-set; erect setæ forming a single line on each interval. Length 3.7 mm.; width 1.65 mm.

California (San Diego). Cab. LeConte. Represented by the unique female type. *Hirtus* is allied to *hystricula*, but is immediately distinguishable by its larger and more transverse prothorax, stouter bodily form, longer beak, very much finer strial punctuation and many other characters. The erect setæ of the elytra are decidedly shorter and more numerous than in *hystricula*.

10 **D. filiolus** n. sp.—Oblong-oval, rather stout, convex, shining, pale flavate throughout; vestiture rather sparse, consisting of long, somewhat fine, recumbent and ashy pubescence, not perceptibly variegated, the elytra bristling with long sparse and erect bristles, disposed in a single line on each interval. *Head* and beak finely, rather densely, evenly punctate, the frontal fovea deep but not very large; beak short, stout, just visibly, evenly arcuate, about as long as the prothorax in the female, not longitudinally furrowed or carinate; antennæ inserted beyond apical two-fifths, somewhat stout, short, the basal joint of the funicle as long as the next three, seventh abruptly wider, transverse, club short, very robust, oval. *Prothorax* short and transverse, two-thirds wider than long, strongly rounded on the sides, convergent and nearly straight but not in the least constricted toward apex, the latter much narrower than the base; punctures rather coarse, very deep and dense but not actually in contact, and with traces of a narrow impunctate line. *Elytra* at base one-third wider than the prothorax, three and one-half times as long, subparallel, the apex conjointly ogival; striæ feebly impressed, coarsely, deeply and closely punctate, the intervals very minutely, feebly, sparsely and indistinctly punctured. *Abdomen* shining, finely, not very closely, distinctly punctate, sparsely and finely pubescent. Length 2.5 mm.; width 1.15 mm.

## Colorado.

The single specimen serving as the type is probably a female. This species is one of the smallest of the genus and is somewhat allied to *hystricula*, but differs greatly in its coarser, sparser punctuation, sparser pubescence and especially in the form of the prothorax, which is shorter, more strongly narrowed anteriorly and not at all constricted behind the apical margin.

11 **D. mannerheimi** Gemm.—Col. Hefte., VIII, p. 122 (Eirrhinus); Lec.: Proc. Am. Phil. Soc., XV, p. 166; *vestitus* Mann.: Bull. Mosc., 1853, II, p. 242 (Eirrhinus).

Oblong, moderately stout, convex, scarcely shining, densely and almost uniformly clothed throughout with short robust recumbent hairs of a dark cinereous tint, and without long erect setæ; body black, the legs piceous; antennæ paler, piceous. Beak very short, stout, densely punctured and setose but not longitudinally grooved, opaque, feebly arcuate and equal in length to the prothorax; antennæ inserted but slightly beyond apical two-fifths, the basal joint of the funicle robust and but little longer than the next two. Prothorax short, fully one-half wider than long, parallel and rounded on the sides, strongly constricted and broadly subtubulate at apex, extremely densely, not very coarsely punctured, without impunctate line. Elytra at base much wider than the prothorax and about three and one-half times as long, the sides parallel and straight, rounded in apical third, with a small sutural notch; striæ rather coarsely deeply and closely punctate, not strongly impressed; intervals but slightly wider than the stria punctures, densely punctulate. Length 2.7 mm.; width 1.25 mm.

Alaska. Cab. LeConte. Easily distinguishable from the other Alaskan species by its dense and uniform pubescence and shorter, broader, more parallel form. It is doubtful if the name substituted by Gemminger should be retained, as the south African *vestitus* is possibly a true Eirrhinus. The anterior femora in *mannerheimi* are distinctly toothed; the others are not in a favorable position for observation in the single specimen which I have studied. The pronotal vittæ, mentioned by Mannerheim, are obliterated in this example, and the small subdenuded spots of the elytra are extremely feebly defined.

12 **D. nubeculinus** n. sp.—Narrowly oblong-oval, convex, shining, sparsely clothed with long white robust and squamuliform hairs, somewhat

unevenly arranged on the elytra and erect and bristling on the head; color pale rufo-testaceous; head and beak blackish, the tip of the latter pale; elytra with a broad triangular basal area and an elongate narrow subsutural spot behind the middle of each blackish; sterna and side-pieces black. *Head* very densely punctate, without distinct frontal fovea; beak short, stout, just visibly bent, rather finely, deeply and moderately densely punctate but not at all sulcate or carinulate, in the male barely longer than the prothorax, with the antennæ inserted at apical third; basal joint of the antennal funicle fully as long as the next three, club moderate, not at all darker in color, with the first joint subglabrous toward base. *Prothorax* short, two-thirds wider than long; sides parallel and nearly straight in middle two-thirds, convergent and rounded near the base, convergent and very feebly sinuate behind the apex, the latter three-fourths as wide as the base; punctures very dense, rather fine, deep; median line very narrowly and feebly carinulate. *Elytra* at base fully one-third wider than the prothorax, nearly four times as long, parallel and straight at the sides, ogival in apical third, the sutural notch subobsolete; striæ barely impressed, coarsely deeply and closely punctate, the intervals not quite twice as wide as the striæ, finely, rather sparsely and confusedly punctate. *Abdomen* rather strongly punctate, blackish toward base and in the median parts of the fifth segment. *Legs* short; femoral teeth rather large and distinct but acute. Length 3.0 mm.; width 1.2 mm.

#### Colorado.

A small narrowly convex species of peculiar coloration, with long coarse and sparse but conspicuous vestiture, and short non-sulcate beak. It is not closely allied to any other form which I have seen.

13 **D. luridus** Mann.—Bull. Mosc., 1853, II, p. 241 (Eirrhinus); Lec.: Proc. Am. Phil. Soc., XV, p. 165.

Oblong, subcuneiform, moderately convex, polished, rufo-testaceous, the head piceous; vestiture rather sparse, consisting of short robust recumbent pale hairs, confusedly condensed and mottled on the elytra, longer and more slender on the pronotum; erect setæ entirely wanting. Head rather coarsely, strongly punctate, the fovea very small; beak not very stout, almost straight, deeply, coarsely punctured in longitudinal furrows, evenly and just visibly arcuate in the female, straight and slightly bent near the apex in the male; in the male it is a little less than one-half as long as the elytra, with the antennæ inserted at apical third, the first funicular joint but little longer than the next two, in the female barely one-half as long as the elytra, the antennæ inserted just behind apical third, with the basal joint of the funicle fully as long as the next three. Prothorax small in both sexes, nearly one-half wider than long, rather coarsely, closely punctate, with a narrow imperfect im-



punctate line, constricted at apex, rounded and subparallel on the sides. Elytra at base distinctly wider than the prothorax, a little more than three times as long as the latter, wider behind; striae punctures coarse, deep and close-set; intervals finely but deeply, evenly, not very closely punctate. Abdomen strongly punctate. Length 3.4–4.3 mm.; width 1.4–1.8 mm.

Alaska, Washington State and California (San Francisco and Los Angeles). This is a very abundant, widely distributed and constant species and may be easily recognized by the characters stated in the table. In one immature specimen before me a large region of the elytra toward the suture is piceous-black, confusedly speckled with paler spots.

14 **D. rufulus** Mann.—Bull. Mosc., 1853, II, p. 240 (Eirrhinus); Lec.: Proc. Am. Phil. Soc., XV, p. 165.

Oblong, rather convex, rufo-testaceous and feebly shining throughout; sterna and side-pieces picescent; vestiture sparse and scarcely at all condensed in spots, consisting of short prostrate pale hairs. Head deeply punctate, without frontal fovea, the beak in the female moderately stout, feebly arcuate, distinctly longer than the head and prothorax, deeply punctato-sulcate; antennae inserted rather behind apical third, the basal joint of the funicle subequal to the next three. Prothorax one-half wider than long; sides parallel evenly and rather strongly arcuate; apical constriction small and strong, the apex four-fifths as wide as the base, broadly tubulate; punctures moderate in size, narrowly separated, with a fusiform impunctate space at the middle. Elytra at base nearly two-fifths wider than the prothorax, almost four times as long, scarcely perceptibly wider behind the middle; sides convergent and nearly straight in apical third, the apex narrowly obtuse; sutural notch obsolete; striae punctures not very large but deep, moderately close-set; striae not impressed; intervals wide, minutely, indistinctly punctate. Abdomen not coarsely, strongly, rather sparsely punctured. Femora not very stout, the tooth small, distinct and very acute. Length 4.3 mm.; width 1.8 mm.

Alaska. Cab. LeConte. The single specimen, from which the above outline is drawn, is a female, the abdomen being evenly convex toward base. It is quite closely allied to *luridus* but is a larger, stouter species, with shorter and thicker beak, always pale in color and with decidedly smaller eyes, so that when the insect is viewed in profile, there is a large part of the head visible above them.

15 **D. cuneatulus** n. sp.—Rather narrowly cuneate, convex, polished, black throughout, the pronotum and elytra occasionally with small feebly-marked paler spots near the humeri; vestiture sparse, consisting of short robust recumbent hairs, whitish in color and confusedly and vaguely condensed in spots and transversely wavy lines behind the middle of the elytra. *Head* strongly but only moderately closely punctate, the fovea almost obsolete; beak somewhat stout, cylindrical, equal in thickness, strongly, longitudinally furrowed and closely, obscurely punctate in both sexes, but differing greatly in length; in the male decidedly short, as long as the head and prothorax, straight, feebly bent near the apex, the antennæ inserted at apical third; in the female rather long, evenly, very feebly arcuate, about two-fifths as long as the body, with the antennæ inserted rather beyond apical two-fifths; antennæ somewhat slender, the first funicular joint not quite as long as the next three in both sexes, the second about as long as the next two in the female, but slightly shorter in the male, rufo-testaceous with the club darker. *Prothorax* nearly two-fifths wider than long, not differing greatly in the sexes, parallel and broadly rounded at the sides, strongly constricted and broadly tubulate at apex, coarsely deeply and moderately closely punctate, without distinctly marked impunctate area. *Elytra* at base distinctly wider than the prothorax, fully three times as long as the latter, broadly feebly inflated behind, obtusely ogival in apical third; striæ feebly impressed, coarsely deeply and closely punctate, the intervals minutely and not very densely so. *Abdomen* rather strongly indistinctly and subrugosely punctured. Length 3.3–3.7 mm.; width 1.3–1.6 mm.

California (Siskiyou Co.).

A small, somewhat narrow and convex species allied to *luridus*, but distinguishable by its black coloration and by the much greater sexual disparity in the length of the beak, the latter being actually a little shorter in the male than in the corresponding sex of *luridus*. The body is narrower and the antennal club larger and relatively longer in *cuneatulus*.

16. **D. alaskanus** n. sp.—Narrow, oblong, subparallel, moderately convex, shining, piceous-black, the elytral suture and flanks pronotum at base and apex, legs and antennæ, except the club, paler; vestiture very sparse, consisting of short robust recumbent hairs, condensed, larger and whiter in very small remote spots on the elytra. *Head* strongly deeply and closely, the beak very densely and opaquely, punctate, the latter longitudinally channeled, in the male rather stout, feebly arcuate toward apex, equal in length to the head and prothorax, the antennæ inserted at apical third, the basal joint of the funicle rather robust, not as long as the next three. *Prothorax* one-half wider than long, subparallel and rounded on the sides, strongly constricted at apex, the latter broadly and briefly tubulate, nearly as wide as the base; disk rather coarsely deeply and somewhat sparsely punctate, with a central feebly-defined, elongate subimpunctate area. *Elytra* at base about one-third wider than the prothorax, rather more than three times as long; sides almost straight and

parallel in basal two-thirds; apex ogival, the sutural notch minute; disk with just visibly impressed series of coarse, deep, not very close-set punctures, the intervals minutely, feebly and somewhat sparsely punctate. *Abdomen* finely, sparsely punctured. Length 3.0 mm.; width 1.1 mm.

Alaska. Cab. LeConte.

A small species allied to *luridus*, but narrower, more sparsely pubescent, darker in color and with a shorter beak in the male; the antennal club is distinctly longer and larger than in *luridus*. In form it somewhat resembles *subfasciatus*, but the prothorax is less strongly rounded on the sides and the punctuation very much coarser and sparser.

17 **D. marginatus** n. sp.—Oblong, feebly convex, rather dull, rufo-testaceous; sterna, abdomen except near the apex, a feeble clouded transverse area on the pronotum before the middle, head, beak except at tip and a broad subsutural vitta on each elytron, from the base nearly to the apex, more or less blackish; vestiture moderately dense, consisting of short robust recumbent hairs, feebly condensed in small and paler spots on the elytra, unevenly denser toward the sides of the pronotum and paler in two small approximate spots before the middle. *Head* very densely, deeply punctate, without frontal fovea, the squamules erect, dense and bristling along the inner margin of the eyes; beak as long as the head and prothorax, rather stout, deeply punctato-sulcate, feebly arcuate; antennæ inserted near apical third, the basal joint of the funicle as long as the next three, club moderate, piceous-black. *Prothorax* one-third to one-half wider than long, subparallel and rounded on the sides, distinctly constricted behind the apex, rather coarsely, very deeply and densely punctate, without impunctate line. *Elytra* at base one-third wider than the prothorax, from more than three to nearly four times longer than the latter, parallel and nearly straight on the sides, acutely ogival in apical third; sutural notch rather large, deep and triangular; striæ not impressed, the punctures moderately coarse, very deep and close-set; intervals minutely, indistinctly but rather closely punctate. *Abdomen* somewhat coarsely, moderately closely punctate. *Legs* rather short; femora stout, moderately but distinctly dentate. Length 3.6–4.0 mm.; width 1.4–1.6 mm.

California.

This is a rather distinct species, allied to *vagenotatus*, but always easily separable by the well-defined abbreviated subsutural vitta.

18 **D. indifferens** n. sp.—Oblong-oval, rather shining and convex, dark rufo-testaceous in color, the head, beak, sterna and the elytra indefinitely toward the middle, black or piceous; elytral suture always narrowly rufous; tip of beak pale testaceous; legs and antennæ rufo-testaceous; vestiture rather sparse, consisting of short robust pointed and prostrate hairs, whitish in color, confusedly condensed and subdenuded on the elytra. *Head* not coarsely but deeply, very densely punctate, finely sparsely squamulose,

with a round perforate fovea on a line through the posterior margin of the eyes, beak rather stout, nearly straight, feebly bent toward apex, coarsely, densely punctato-sulcate, equal in length to the head and prothorax in the female, slightly shorter in the male, the antennæ inserted at apical third, or slightly behind this point in the female, the basal joint of the funicle about as long as the next three, second almost as long as the succeeding two, club moderate. *Prothorax* fully one-half wider than long, the sides parallel, broadly, distinctly arcuate, abruptly, deeply constricted behind the apex, the latter transversely truncate, three-fourths as wide as the base; punctures not coarse, very deep, dense but not coalescent, with a very fine subcariniform median line. *Elytra* at base two-fifths wider than the prothorax, not quite four times as long; sides subparallel, gradually rounded in apical two-fifths, sutural notch shallow, broadly angulate; striæ feebly impressed, not very coarsely but deeply and closely punctate; intervals nearly three times as wide as the punctures, minutely, rather indistinctly punctate. *Abdomen* polished, finely, distinctly, not densely punctate, two basal segments blackish, the remainder rufous. *Legs* rather slender; femora with a small acute tooth, rather feebler on the intermediate as usual. Length 3.0-4.0 mm.; width 1.3-1.7 mm.

New York; Illinois; Iowa; Kansas.

A common Atlantic form, resembling *rufus* and *vagenotatus*, but distinguishable by the small and deep perforate frontal fovea, which is completely obsolete in those species, and also by its larger size and different coloration.

19 **D. vagenotatus** n. sp.—Oblong, feebly convex above, piceous-black; abdomen toward apex, legs, antennæ except the club, pronotum laterally and a narrow suffused stripe near the side of each elytron paler and more or less rufous; integuments confusedly marmorate with small confused condensed patches of short white pointed hairs, less mottled and almost uniformly pubescent along the lateral paler stripe. *Head* very densely, deeply punctate, without frontal fovea, the squamules near the eye abundant but short; beak moderately stout, broadly, feebly arcuate toward apex, distinctly longer than the head and prothorax, deeply, densely punctato-sulcate, the antennæ in the male inserted just behind apical third, the first funicular joint about as long as the next three, second not quite as long as the next two, club rather large, elongate, conoidal and gradually pointed. *Prothorax* one-half wider than long, parallel and strongly, evenly arcuate on the sides, strongly constricted behind the apex, the latter subtubulate; punctures moderately coarse, very deep and dense; impunctate line subobsolete. *Elytra* at base one-third wider than the prothorax, three and one-half times as long, parallel and straight at the sides, obtusely parabolic in apical fourth; sutural notch small, feeble and cuspidiform, not triangular; stria punctures coarse, very deep, rather close-set; intervals about twice as wide as the punctures, minutely, sparsely punctulate. *Abdomen* finely, sparsely punctate. *Legs* long; tooth of the anterior femora large, rectangular. Length 3.6 mm.; width 1.5 mm.



## Indiana.

The type and unique specimen is a male, the abdomen having a large rounded and deep impression near the base. It is allied to *rufus* but differs in its larger size, coloration, longer beak and more elongate antennal club, longer legs, more distinct femoral teeth, and in the finer, shorter vestiture, more distinctly defined in white marmorate patches on the dark elytra.

20 **D. rufus** Say.—Deser. N. A. Curc., July, 1831; Ed. Lec., I, p. 293 (Eriirhinus).

Oblong, feebly convex, pale flavo-testaceous throughout, the elytra feebly clouded with brownish toward the middle; integuments shining, not very densely clothed with robust squamuliform hairs, confusedly condensed in transversely wavy spots and whitish in color. Head very densely punctate, the squamules along the inner margin of the eye erect and bristling; beak rather stout, somewhat longer than the head and prothorax in the female, and with the antennæ inserted beyond apical two-fifths, rather coarsely, densely lineato-sulcate and punctate, very feebly arcuate; antennæ rather slender, the basal joint of the funicle not quite as long as the next three, second but slightly longer than the third; club moderate, slightly darker in color, sparsely pubescent. Prothorax one-half wider than long; sides subparallel and rather strongly arcuate, convergent and just visibly sinuate near the apex; punctures rather coarse, very deep, somewhat dense, without impunctate line. Elytra at base one-third wider than the prothorax, but slightly more than three times as long, parallel, obtusely rounded in not more than apical third; sutural notch small but deep; stria punctures coarse deep and very close-set; intervals flat, twice as wide as the stria punctures, sparsely, very feebly punctulate. Legs short, stout, the femoral teeth minute but distinct on the anterior. Length 3.0–3.2 mm.; width 1.3 mm.

Kansas. The three specimens before me exhibit scarcely any variation. This species may be readily known by its pale ochreous color, feebly clouded along the median parts of the elytra, the small size, coarse, subsquamiform vestiture and by several other distinctive characters.

21 **D. fusciceps** n. sp.—Oblong, rather broad and subdepressed, pale ochreous-flavate, the head and beak piceous-black; sterna piceous, each elytron almost imperceptibly clouded with a darker tint in a broad subsutural

area from basal third to apical fifth; vestiture very dense but scarcely at all condensed in spots, consisting of very short robust and decumbent hairs, becoming squamulose in a small spot at each side of the pronotal disk. *Head* very densely punctate, with a small frontal fovea; beak stout, very feebly arcuate, as long as the head and prothorax, deeply punctato-sulcate; antennæ moderate, inserted at apical third, the basal joint of the funicle fully as long as the next three. *Prothorax* short and strongly transverse, three-fourths wider than long; sides parallel and almost straight in middle third, convergent toward base and rather abruptly, strongly so and straight in apical fourth; apex truncate, about three-fifths as wide as the base; punctures rather small, very dense, without impunctate line, a narrow median line infusate. *Elytra* large and broad, barely two-thirds longer than wide, fully one-third wider than the prothorax and four times as long, subparallel, gradually ogival behind in apical two-fifths; sutural notch very feeble, cuspidiform; stria punctures moderate; intervals from two to nearly three times as wide as the striæ, finely, very densely and subrugosely punctate. *Legs* rather short; femoral teeth small, the anterior acute. Length 4.3 mm.; width 1.9 mm.

Iowa.

Represented by a single specimen deprived of abdomen, but probably a male. It is allied to *rufus*, although very much larger and relatively wider, with denser punctuation and shorter much less conspicuous vestiture. In *fusciceps* the subapical constriction of the prothorax is totally obsolete; it is broad and almost obsolete in *rufus* and deep and abrupt in *marginatus*.

22 *D. brevicollis* Lec.—Proc. Am. Phil. Soc., XV, p. 165.

Oblong, rather convex, not very stout, shining, blackish-piceous, the beak, legs and antennæ rufescent; vestiture consisting of short robust and prostrate hair, whitish in color and more or less condensed in indefinite spots on the elytra, rather dense and conspicuous. Head very deeply, densely punctate, with a deep frontal fovea; beak rather longer than the head and prothorax, deeply punctate, finely sulcate, feebly arcuate, moderately stout; antennæ somewhat slender, the basal joint of the funicle rather long, fully as long as the next three. Prothorax one-half wider than long, subparallel and strongly arcuate at the sides, strongly convergent and just visibly sinuate toward apex, the latter rather narrow, not more than two-thirds as wide as the base; punctures coarse, deep and dense, with a small elongate impunctate spot at the middle. Elytra at base one-third wider than the prothorax, very nearly four times as long, straight and parallel at the sides, rounded in apical third;

sutural notch almost obsolete; strial punctures coarse, deep and close-set. Abdomen rather coarsely and closely punctate. Length 3.7 mm.; width 1.4 mm.

Lake Superior and Minnesota. Resembles *rufulus* somewhat, but differs in its narrower form, more strongly convergent sides of the prothorax toward apex, the latter being very much narrower when compared with the base, in its decidedly coarser punctuation, especially of the pronotum, and in the coarser, denser vestiture. The two specimens before me are apparently males, and the one from Minnesota is pale flavo-testaceous throughout, probably from immaturity, with the frontal fovea practically obsolete, this not being so constant a feature as it apparently is in *indifferens*.

23 **D. subsignatus** Mann.—Bull. Mosc., 1853, II, p. 241 (Eirrhinus).

Rather slender, convex, feebly subcuneate; body piceous-black, the pronotum rufescent toward base and apex, the elytra dark rufo-testaceous, each indefinitely clouded with blackish in the middle toward base and also near the apex; legs and antennæ pale, the club of the latter dark. Head and beak finely deeply and extremely densely punctate, dull, the beak finely, obsoletely carinulate, rather stout, almost straight and scarcely longer than the prothorax, the antennæ inserted at fully apical third in the male, the basal joint of the funicle not longer than the next two, second not as long as the third and fourth combined. Prothorax nearly one-half wider than long, rather wider and very strongly rounded before apical third, the sides thence strongly convergent and scarcely visibly constricted to the apex; disk finely, very densely punctate, with a narrow partial impunctate line. Elytra at base very slightly wider than the disk of the prothorax, nearly four times as long as the latter, just visibly widest behind the middle, gradually rounded in apical two-fifths, the apex narrowly obtuse; striæ rather distinctly impressed, not very coarsely but deeply and closely punctate; intervals minutely, rather densely and subrugosely punctate. Abdomen finely, densely punctate. Femoral teeth all large and prominent. Length 3.2 mm.; width 1.3 mm.

Alaska. Cab. LeConte. This species somewhat resembles *luridus*, but is much narrower and is easily recognizable by the exceptionally fine and dense punctuation, especially of the anterior portion of the body.

24 **D. longulus** Lec.—Proc. Am. Phil. Soc., XV, p. 166.

Elongate-oval, convex, subcuneate, rather shining, rufo-testaceous, often more or less clouded with piceous-black, the head and beak toward apex always darker; vestiture not very dense, consisting of short stout pointed and semi-erect hairs, whitish in color. Beak strongly punctate, very feebly sulcate, moderately stout, almost perfectly straight, as long as the head and prothorax, with the antennæ inserted at apical two-fifths in the female, a little shorter with the antennæ inserted at apical third in the male; antennæ moderate, the basal joint of the funicle as long as the next two; club rather large, densely pubescent and piceous-black. Prothorax small, subcylindrical, with broadly arcuate sides, one-third to two-fifths wider than long, not constricted at apex, convex, finely, rather densely punctate, without distinct impunctate line. Elytra at base fully one-third wider than the prothorax, feebly, gradually inflated posteriorly and widest behind the middle, the apex thence gradually, acutely ogival; sutural notch small but distinct, broadly angulate; stria punctures rather coarse, deep and close-set; intervals feebly convex, about twice as wide as the stria punctures, minutely, sparsely punctate. Under surface deep black and rather dull throughout, finely, confusedly punctate. Length 3.2–3.7 mm.; width 1.25–1.5 mm.

Alaska. A rather isolated species easily recognizable by its narrowly convex and cuneate-oval form, almost perfectly straight beak darker toward tip, rather fine pronotal punctures and several other characters.

25 **D. squamosus** Lec.—Proc. Am. Phil. Soc., XV, p. 166; *tessellatus* || Walsh, : Proc. Ent. Soc. Phila., VI, p. 267 (*Anthonomus*).

Narrowly oblong-oval, convex, dark rufo-testaceous throughout; sterna often blackish; integuments somewhat shining, rather densely clothed with small elongate and recumbent scales, yellowish-white in color, feebly, sparsely and very indefinitely, coarsely mottled on the elytra toward the suture, and less dense in middle two-thirds of the pronotum. Beak evenly, quite distinctly arcuate, equally, evenly cylindrical throughout and as long as the head and prothorax in both sexes, densely punctate, longitudinally, feebly carinulate laterally, the antennæ inserted at fully apical third in the male and but slightly behind this point in the female; basal joint of the funicle barely as long as the next three; club small, stout, very abrupt, the basal joint in great part subglabrous. Prothorax wider than



long, subparallel and broadly rounded at the sides, distinctly constricted and broadly subtubulate at apex, very densely, deeply punctate, without distinct impunctate area. Elytra at base fully one-third wider than the prothorax, parallel and nearly straight at the sides, rounded in apical third, the sutural notch small but deep and angulate; stria punctures moderately coarse, deep, somewhat close-set, each bearing a distinct elongate squamule. Length 2.7–3.3 mm.; width 0.9–1.3 mm.

Illinois and Kansas. Easily distinguishable by the narrow convex form, dark rufo-ferruginous color and the vestiture, which is dense and distinctly squamiform toward the sides of the body, but more hair-like along the median parts of the upper surface. The tooth of the anterior femora is very small but distinct, that of the others nearly obsolete. In one narrow male there is a small denuded spot in the middle of each of the lateral squamose vittæ of the pronotum.

26 **D. marmoreus** n. sp.—Oval, convex, rather dull, black; antennæ, legs and elytra in a very feebly defined sublateral vitta rufescent; vestiture dense, consisting of narrow recumbent lanceolate scales, white in color in two narrow approximate pronotal vittæ and a small median spot at each side, and, on the elytra, along the suture and in very uneven discal spots, elsewhere subdenuded and piceous-black. Head and beak extremely densely punctate, dull, squamulose, the latter longitudinally rugose but scarcely carinulate, thick, feebly arcuate, not quite as long as the head and prothorax; antennæ inserted just behind apical third, the basal joint of the funicle as long as the next three, club moderate, densely pubescent throughout. Prothorax small, one-third wider than long, subparallel, evenly and moderately arcuate at the sides, becoming more convergent, nearly straight and not visibly constricted anteriorly; apex broadly arcuate, nearly three-fourths as wide as the base; disk rather coarsely, very deeply and extremely densely punctate, without trace of impunctate line. Elytra at base nearly one-half wider than the prothorax, more than three times as long as the latter, acutely parabolic in apical two-fifths, the sutural notch very small and feeble, stria punctures moderately coarse, very deep, close-set; intervals minutely, indistinctly punctate. Abdomen not coarsely but deeply, very densely punctate. Legs short; femora stout, picescent toward apex, the tooth small but distinct on all, the intermediate and posterior with a large polished glabrous area on the posterior side in basal half. Length 3.2 mm.; width 1.4 mm.

New Mexico.

This is an isolated species, comparable only with *squamosus*, but differing greatly in its rather more robust form, stout beak, black color and strongly marked maculation of linear white scales.

**SMICRONYX** Schönh.*Pachytychius* Lec. nec Jekel; *Desmoris* Lec.

The genus *Pachytychius* of Jekel, as represented by the European *squamosus* Gyll., examples of which have been recently sent me by M. Desbrochers des Loges, has the beak unconstricted at base and similar to that of *Tychius*, and the tarsal claws small, simple, divergent and distant at base, forming in fact one of the connective bonds between the *Erirhinini* and *Tychiini*. *Pachytychius* does not appear to be represented in the American fauna, and the two species provisionally placed there by LeConte are entirely identical in all structural characters, which can in any way be considered of generic worth, with the form described by that author as *Smicronyx corporulentus* and the other species placed in *Smicronyx*.

*Desmoris* of LeConte was founded upon two species of rather larger size than the others, but, if care be taken to examine *D. constrictus*, it will be found a perfect homologue of such species as *Smicronyx sordidus* and *griseus*, in all points of facies and structure.

*Smicronyx* is a rather large genus, constituting a special group of the *Erirhinini*, characterized by the strong basal constriction of the beak and the simple tarsal claws which are invariably connate in basal third or fourth. It is somewhat heterogeneous in the external aspect of its species, both here and in Europe, but as far as can be perceived is entirely uniform in the essential generic structures referred to, as well as in abdominal structure, in the coarsely faceted eyes, somewhat approximate beneath, and in the deeply sinuate apical margin of the prosternum. The elytra are, as a rule, distinctly wider at base than the disk of the prothorax, but are not as elongate as in *Dorytomus*, and are generally acutely rounded behind in apical half, with the tenth stria very short and remote from the ninth, closely approaching the latter behind the humeri. The scutellum is small, the legs rather short and stout, the femora unarmed, the tibial spur distinct, and the third tarsal joint dilated and bilobed, the fourth being somewhat short or moderate in length.

The species are small in size, and include among them some of the most minute curculionides known to us at present. Those of our fauna may be provisionally classified as follows:—

Fifth elytral interval densely clothed nearly throughout with white scales; second joint of the antennal funicle almost as long as the first; body robust, oval, convex, densely but unevenly squamose...1 **lineolatus**

- Fifth interval not conspicuously vittate; second funicular joint very variable in length but always much shorter than the first.....2
- 2**—Elytral scales almost uniform in size and density throughout the disk, uniform in coloration or more or less conspicuously mottled.....3
- Elytral vestiture very uneven, condensed in subtransversely wavy areas, in which the scales become larger, denser and generally paler in color.....16
- 3**—Elytra inflated and only slightly longer than wide.....4
- Elytra not inflated, much longer than wide, parallel at the sides toward base...5
- 4**—Prothorax distinctly narrower than the base of the elytra, the latter with a large subbasal area of dark brown or blackish scales.
- Elytral striæ coarse and distinctly punctate.....2 **discoideus**
- Elytral striæ fine throughout; form narrower.....3 **corpulentus**
- Prothorax scarcely perceptibly narrower than the base of the elytra, and with two conspicuous white discal vittæ.....4 **amœnus**
- 5**—Vestiture uniformly bright orange-red in color, dense throughout.
- 5 fulvus**
- Vestiture vaguely nubilata with whitish, the elytra with a large quadrate subbasal spot of velvety black.....6 **quadrifera**
- Vestiture varying in its shades of ochreous or cinereous, uniform, confusedly mottled or otherwise variegated.....6
- 6**—Sides of the prothorax parallel and straight in basal two-thirds to three-fourths .....7
- Sides of the prothorax evenly and distinctly arcuate in basal two-thirds approximately.....8
- 7**—Prothorax narrowed but scarcely at all constricted near the apex; body large, oblong.....7 **profusus**
- Prothorax very strongly and abruptly constricted behind the apex; recurved setæ of the elytra long, coarse, sparse but strongly hispid and conspicuous.
- 8 intricatus**
- 8**—Elytra at least very nearly three times as long as the prothorax.....9
- Elytra distinctly less than three times as long as the prothorax.....13
- 9**—Third elytral interval rather wider and more prominent; body clothed with an extremely dense crust of uniform ochreous scales.....9 **pusio**
- Third elytral interval not more prominent.....10
- 10**—Elytral scales extremely dense, widely imbricated.....11
- Elytral scales scarcely contiguous, sometimes sparse.....12
- 11**—Prothorax rather large, somewhat broadly inflated and much wider than long .....10 **corniculatus**
- Prothorax small, about as long as wide, subcylindrical; species small.
- Scales of the upper surface very large, broadly oval .....11 **imbricatus**
- Scales smaller and narrower, elongate-oval.
- Elytra at base scarcely more than one-third wider than the prothorax; body narrow .....12 **silaceus**
- Elytra at base about one-half wider than the prothorax; body more robust .....13 **spurcus**
- 12**—Elytra more or less rufous .....14 **vestitus**
- Elytra black .....15 **sparsus**

- 13**—Elytral vestiture uniform in coloration or very feebly and confusedly mottled .....14  
 Elytral vestiture broadly white toward the sides, abruptly and broadly brown along the suture.....16 **pleuralis**
- 14**—Elytral scales moderate in size, rather persistent .....15  
 Elytral scales very large, oval and pointed, easily removable...17 **obtectus**
- 15**—Beak in the female very long and slender, with the antennæ inserted far behind the middle.  
 Pronotum more shining, the punctuation finer and sparser; size rather small .....18 **sordidus**  
 Pronotum densely punctate.  
 Larger species, the legs usually red; beak in the female squamulose only near the base .....19 **constrictus**  
 Smaller species, the legs piceous; beak of the female more or less squamose in basal half.....20 **griseus**  
 Beak in the female much shorter, with the antennæ inserted at the middle; elytral vestiture just perceptibly more condensed on the sutural interval.
- 21 connivens**
- 16**—The elytral vestiture uneven only toward the suture; prothorax about as long as wide, slightly constricted behind the apex.....22 **seriatus**  
 The vestiture uneven throughout the elytral disk.....17
- 17**—Elytra much longer than wide, not wider near the middle.....18  
 Elytra but very slightly longer than wide, appreciably wider near the middle than at base.....22
- 18**—Elytra more or less rufous, at least toward the sides.....19  
 Elytra black throughout .....20
- 19**—Prothorax large, very nearly as long as wide, the punctures coarse, rounded and not confluent.  
 Smaller species, the pronotal scales narrower sparser and hair-like toward the middle.....23 **fiducialis**  
 Larger, the pronotum evenly but not extremely densely squamose throughout .....24 **scapalis**
- Prothorax rather large, transverse, strongly rounded at the sides, the punctures oval and more or less confluent, forming long rugæ; vestiture dense but strongly mottled .....25 **flavicans**
- Prothorax moderately large, convex, strongly constricted near the apex, nearly as long as wide, the punctures rounded, dense but not confluent; body rufous .....26 **congestus**
- Prothorax small or moderately large, always strongly rounded on the sides and with the punctures reniform or lunate; elytral vestiture consisting of isolated wavy lines or spots of condensed scales, the interspaces almost glabrous.  
 Pronotal punctures rather sparse, widely isolated on the disk, the interspaces polished.....27 **tychioides**  
 Pronotal punctures dense.  
 Pronotum with a median impunctate line, which is almost entire and finely granulato-reticulate.....28 **sagittatus**



Pronotum without trace of median impunctate line; prothorax small.

29 **sculpticollis**

20—Prothorax not or very feebly constricted behind the apex.....21

Prothorax very strongly constricted and subtubulate at apex, the pronotal punctures small, oval, subconcentrically arranged; legs red.

30 **instabilis**

21—Legs black.

Larger species; basal constriction of the beak strong .....31 **cinereus**

Smaller, the constriction feeble; pronotal sculpture coarse and rugose.

32 **apionides**

Legs rufous or rufo-piceous; pronotal punctures oval or sublinear, distinctly separated.

Interspaces of the pronotal punctures polished; elytral scales large and conspicuous but not dense, only moderately uneven in distribution.

33 **perpusillus**

Interspaces strongly and densely punctulate and dull; elytral scales smaller and more elongate.....34 **defricans**

22—Prothorax distinctly wider than long, much more than one-half as wide as the elytra at their point of greatest width.

Pronotal punctures very dense, reniform or sublunate; elytra in great part rufous .....35 **gibbistrostris**

Pronotal punctures large, rounded, very dense; elytra black throughout.

36 **squalidus**

Prothorax much narrower, never more than slightly exceeding one-half the maximum width of the elytra, nearly as long as wide; body much smaller than in *squalidus* .....37 **ovipennis**

1 **S. lineolatus** n. sp.—Robust, convex, oblong-oval, black, the tibiae rufescent; scales of the upper surface white, moderate in size, unevenly distributed, feebly mottled toward the suture, forming a dense conspicuous line at the base of the third and seventh intervals, and, on the fifth, almost throughout its extent; on the under surface white and very dense but sparser on the metasternum than on its episterna. *Head* squamulose, the transverse constriction fine, deep; beak in the male moderately stout, evenly arcuate, punctate, sparsely squamulose, equal in length to the head and prothorax, with the antennæ inserted at apical two-fifths, in the female longer, evenly, strongly arcuate, smooth, much longer than the head and prothorax and three-fifths as long as the elytra, the antennæ inserted at about the middle; antennæ long, slender, the second funicular joint but slightly shorter than the first and longer than the next two, the club rather slender, elongate, fusiform, very densely pubescent. *Prothorax* one-third wider than long, not strongly inflated, usually more strongly arcuate before the middle, strongly and broadly constricted behind the apex, the latter nearly four-fifths as wide as the base; disk strongly, densely punctate, with a broad darker median vitta in which the scales become narrow, sparse and transversely arranged. *Elytra* at base nearly one-half wider than the prothorax, not quite three times as long, the sides rapidly convergent toward the acutely parabolic apex, becoming parallel

and nearly straight in basal half; striæ rather coarse, deep, punctured at the bottom. Length 2.3–3.3 mm.; width 1.15–1.55 mm.

Illinois; Texas.

A distinctly marked species, apparently rather abundant. My first specimens were received some years since from Mr. F. M. Webster.

In this species the pronotal scales are not arranged like those of *corpulentus* and *discoideus*, where they radiate from a central point. The punctures toward the middle of the pronotum are also different, being transverse and not rounded.

2 **S. discoideus** Lec.—Proc. Am. Phil. Soc., XV, p. 169 (*Pachytychius*).

Robust, oval, convex, black, the legs slightly rufo-piceous; scales moderate in size, closely decumbent, widely overlapping, white or yellowish-white, the middle of the pronotum broadly, and a large sutural basal and small lateral median area of the elytra, both uneven, clothed more sparsely with blackish scales; recurved setæ of the elytra in the form of elongate concolorous scales and scarcely visible under low power. Beak in the male thick, punctured, squamulose, dull, evenly, feebly arcuate, but slightly longer than the head and prothorax, with the antennæ inserted at apical third, in the female much longer, a little more slender, smoother, less punctate, evenly, moderately arcuate, two-thirds as long as the elytra, with the antennæ inserted at apical two-fifths; antennæ long, the second funicular joint three-fourths as long as the first and fully as long as the next two. Prothorax two-fifths wider than long, parallel, evenly and strongly rounded on the sides, constricted behind the apex. Elytra at base one-fourth wider than the prothorax, a little more than twice as long; sides arcuate, convergent behind and feebly sinuate in the male; disk convex, the striæ becoming coarse, deep and strongly punctate in the basal darker area. Tarsal claws slender, feebly divergent, connate in basal fourth. Length 3.0–3.2 mm.; width 1.6–1.75 mm.

Illinois. A well-known species of rather large size and obese form. One badly preserved male before me, taken by Mr. Wickham, at Elko, Nevada, cannot be distinguished from the eastern forms except by its slightly shorter beak.

3 **S. corpulentus** Lec.—Proc. Am. Phil. Soc., XV, p. 170.

Robust, convex, rather broadly oval, black, the legs bright rufous; scales of the upper surface elongate-oval, narrowly truncate at apex,

widely overlapping and extremely dense, yellowish in color, a large suffused sutural spot from the middle of the elytra to the scutellum, becoming narrower anteriorly, equally densely clothed with brown scales; median parts of the pronotum rather darker, the scales being slightly sparser; recurved setæ indistinct. Head finely but roughly punctate, squamulose anteriorly, the constriction fine, deep; beak in the male not very thick, feebly, evenly arcuate, dull, punctate, sparsely squamose, quite distinctly longer than the head and prothorax, the antennæ inserted at apical third, in the female longer, smoother, minutely, sparsely punctate except toward base, evenly, moderately arcuate, three-fifths as long as the elytra, the antennæ inserted at apical two-fifths; antennæ moderate, second funicular joint fully as long as the next two but rather longer in the female than in the male; club somewhat large, elongate-oval. Prothorax one-half wider than long, the sides subparallel, strongly, evenly arcuate, more convergent anteriorly and very broadly, just visibly constricted. Elytra at base one-fourth wider than the prothorax, nearly three times as long; sides nearly straight and scarcely at all arcuate in basal half; disk just visibly wider behind the middle; apex acutely, evenly ogival; striæ fine throughout. Length 2.0–2.8 mm.; width 1.0–1.55 mm.

Texas (Austin and El Paso); Arkansas and Louisiana. I found this species some years ago in great abundance on the banks of the Colorado River, in June. It is allied to *discoideus* and differs in its fine elytral striæ toward the middle and base, in the narrower bodily form and smaller size, red legs, and in the color of the vestiture. The brown subbasal spot of the elytra is frequently obsolescent.

4 **S. amœnus** Say.—Curc. 26, Ed. Lec., I, p. 294 (Tychius); Lec.: Proc. Am. Phil. Soc., XV, p. 168 (Pachytychius).

Broadly oval, convex, black, the legs rufous to piceous; upper surface clothed densely throughout with rather large, coarsely strigose scales, which are not imbricated on the elytra, confusedly mottled whitish and dark brown, the whitish scales more conspicuous at the base of the third interval and in two distant vittæ on the disk of the pronotum, often visible only in basal half; under surface and lateral edges of the prothorax densely clothed with whitish scales. Beak thick, feebly arcuate, longer than the head and prothorax, dull, rugose, densely squamose and with the usual fasciculate tufts at base; antennæ inserted at apical two-fifths, the second joint of

the funicle two-thirds as long as the first and not quite equal to the next two. Prothorax strongly inflated and rounded on the sides, two-fifths wider than long, strongly narrowed and broadly distinctly constricted toward apex, the latter scarcely more than three-fifths as wide as the disk. Elytra at base only just visibly wider than the disk of the prothorax, a little more than twice as long, just perceptibly longer than wide, broadly rounded at the sides and gradually strongly narrowed behind to the acutely rounded apex; striæ coarse, not entirely concealed by the vestiture. Length 2.0–2.6 mm.; width 1.15–1.4 mm.

Lake Superior and Dakota. The description is taken from the male.

5 ***S. fulvus*** Lec.—Proc. Am. Phil. Soc., XV, p. 172.

Oblong-oval, convex, black throughout, the legs sometimes dark piceous; integuments densely, uniformly clothed above with moderately large elongate-oval reddish-orange scales, which become smaller, nearly white and somewhat uneven in distribution beneath; recurved setæ fine and not conspicuous. Beak in the male rather slender, smooth, shining and feebly punctate beyond the antennæ, punctate, opaque and slightly squamulose toward base, feebly arcuate, nearly as long as the head and prothorax, with the antennæ inserted just beyond the middle, in the female much longer but not thinner, cylindrical, almost perfectly straight, smooth, shining, feebly punctate and opaque near the base, three-fifths as long as the elytra, with the antennæ inserted distinctly behind the middle; fulvous corniculate tufts at the base conspicuous; antennæ rather short, the second funicular joint but slightly longer than the third. Prothorax a little wider than long, the sides quite strongly convergent from base to apex, broadly, feebly arcuate, distinctly constricted behind the apex, the latter scarcely three-fifths as wide as the base. Elytra parallel in basal half, two-fifths wider than the prothorax and three times as long, the sides not constricted before the apex; striæ indicated by broad partings in the vestiture. Legs moderate; tarsal claws thick, connate in basal third. Length 2.6–3.0 mm.; width 1.1–1.25.

Missouri, Nebraska, Kansas and New Mexico. A sufficiently abundant and isolated species, without any especially close ally in our fauna.

6 ***S. quadrifer*** n. sp.—Oblong-oval, moderately convex, black, the legs more or less rufous; vestiture dense, consisting of oval imbricated scales,



whitish toward the sides and along the middle of the pronotum and broadly in the middle of the elytra, brown elsewhere, yellowish-white and very dense beneath, the elytra with a large sutural quadrate spot from basal sixth to just behind the middle, which is abruptly limited and clothed with piceous-black scales; recurved setæ not very conspicuous. *Head* squamose, the constriction deep; beak in the male thick, feebly arcuate, slightly longer than the head and prothorax, densely opaque, conspicuously squamose and hispid almost throughout, the basal tufts distinct; antennæ inserted near apical third, the second joint of the funicle but slightly longer than the third. *Prothorax* very slightly wider than long, subparallel and broadly, rather feebly arcuate at the sides, distinctly constricted behind the apex. *Elytra* at base two-fifths wider than the prothorax, not quite three times as long, parallel and nearly straight at the sides in basal half, the striæ indicated laterally only by the finest partings of the vestiture, more distinct toward the suture. Tarsal claws rather small, connate in basal third. Length 2.2 mm.; width 1.0 mm.

#### Arizona.

The large subbasal quadrate spot of velvety black will serve to render this species easily recognizable. It somewhat resembles *vestitus* in outline, but is rather stouter. Two specimens.

**7 *S. profusus* n. sp.**—Oblong, convex, black, the legs scarcely piceous; body densely clothed above with large, broadly oval, piceous scales, widely overlapping, feebly and confusedly intermixed with slightly paler scales on the elytra and narrowly paler along the middle of the pronotum; scales of the under surface rather paler and not quite so large; recurved setæ of the elytra not conspicuous, more evident anteriorly. *Head* squamose; constriction deep; beak in the male short, rather stout, feebly, evenly arcuate and slightly tapering from base to apex, densely punctate, hispid throughout with stout erect setæ, and, in addition, very densely squamose toward base, as long as the head and prothorax, the antennæ inserted just visibly beyond the middle, in the female but little longer, more slender, feebly arcuate, smooth, polished, very minutely, sparsely punctulate and glabrous, but rather suddenly swollen, hispid and very densely squamose in a little more than basal fourth, slightly longer than the head and prothorax but not more than two-fifths as long as the elytra, the antennæ inserted at basal two-fifths; antennæ rather long, the second funicular joint as long as the next two in the female, shorter in the male. *Prothorax* nearly one-third wider than long, the sides parallel and straight in basal two-thirds, then rounded convergent and feebly constricted to the apex, the latter not more than one-half as wide as the base; punctures when denuded rather large, round and well separated. *Elytra* at base one-half wider than the prothorax, about three times as long, parallel in basal two-thirds, then rapidly, acutely ogival; striæ indicated by narrow partings of the vestiture. Tarsal claws rather small, subparallel, connate toward base. Length 2.4–3.7 mm.; width 1.15–1.7 mm.

Arizona (Benson). Mr. G. W. Dunn.

A widely isolated species, one of the largest of the genus, but varying remarkably in size. It was taken in abundance.

8 **S. intricatus** n. sp.—Oblong-oval, robust, convex, black throughout; scales of the upper surface large, very dense, dark brown and whitish confusedly intermixed, the recurved setæ very coarse, semi-erect, sparse but very conspicuous: scales of the under surface also large, generally paler but intermixed with a few which are darker. *Head* squamose anteriorly; constriction strong; beak in the male very thick but somewhat long, evenly, distinctly arcuate, feebly tapering, coarsely, very densely punctured, glabrous toward apex, densely hispid-squamose toward base, longer than the head and prothorax and a little more than one-half as long as the elytra; antennæ inserted at apical two-fifths, sparsely clothed with long parallel-sided squamules; second funicular joint one-half longer than the third. *Prothorax* convex, parallel and nearly straight at the sides in basal three-fourths, then rounded and deeply constricted; apex three-fourths as wide as the base; punctures not very large, round, distinct and well separated. *Elytra* at base fully one-half wider than the prothorax, not quite three times as long, barely more than one-third longer than wide, slightly widest behind the middle, the apex broadly ogival; striæ strong and not very fine. Tarsal claws moderate. Length 2.8 mm.; width 1.45 mm.

Texas (El Paso). Mr. Dunn.

The moderately large size, robust convex form, large scales and generally rough hispid appearance will aid in the identification of this distinct species. It is represented before me by a single male. A specimen from Arizona is slightly more elongate, with the beak less punctate and squamose, the antennæ being inserted just beyond the middle; it is probably the female.

9 **S. pusio** Lec.—Proc. Am. Phil. Soc., XV, p. 171.

Oblong-oval, convex, moderately stout, black, the legs and beak piceous, extremely densely clothed throughout with rather large overlapping non-strigose scales, uniformly pale ochreous-yellow in color; recurved setæ very sparse, subdecumbent and not at all conspicuous. Beak in the female rather slender, distinctly, evenly arcuate, about one-half as long as the elytra, smooth and minutely, sparsely punctate in apical half, punctured, dull and densely squamose toward base and feebly bifasciculate just before the very feeble transverse impression; antennæ inserted at the middle, short, strongly squamulose, the second funicular joint slightly longer than the third. Prothorax slightly wider than long, the sides conver-

gent and very obsoletely constricted near the apex. Elytra at base rather more than one-third wider than the prothorax, nearly three times as long, two-fifths longer than wide, parallel and straight at the sides in basal three-fifths, then narrowly parabolic; striæ indicated only by the finest and feeblest partings of the dense crust of scales; third interval a little more prominent and convex. Length 1.75 mm.; width 0.75 mm.

Lower California (Cape San Lucas). Cab. LeConte. A minute but distinct form, not closely allied to any other and readily recognizable by the dense crust of ochreous-yellow scales, and the rather prominent third interval of the elytra. It is distinctly stouter than the Arizonian *silaceus*.

10 ***S. corniculatus*** Fahr.—Sch. Gen. Curc., VII, ii, p. 309 (Tychius); *squamulatus* Lec.: Proc. Am. Phil. Soc., XV, p. 173.

Oblong-oval, rather robust, convex, black, the legs paler; vestiture dark gray, feebly and distantly mottled with whitish on the elytra, and generally with a short whitish line at base of the third interval; scales broadly oval, very dense, a tuft of erect squamules above each eye, and with the usual erect recurved squamules on the pronotum and elytra. Beak in the male a little longer than the head and prothorax, rather thick, punctate and squamose, very feebly arcuate, with the antennæ inserted at apical two-fifths, in the female distinctly longer, more slender and tapering, smooth, a little more arcuate and nearly one-half as long as the body, with the antennæ inserted slightly behind the middle, the second joint of the funicle one-half longer than the third. Prothorax small, one-fourth wider than long, narrowed and feebly constricted near the apex. Elytra at base one-half wider than the prothorax, very nearly three times as long, one-half longer than wide, the sides straight and parallel in basal half, then gradually acutely ogival; striæ fine. Length 2.0–2.4 mm.; width 0.9–1.1 mm.

Massachusetts and Pennsylvania (near Philadelphia); Michigan—Cab. LeConte. This is one of our most abundant eastern species, somewhat resembling *flavicans*, but smaller and less mottled. It agrees throughout with the description given by Fahræus, which was founded upon a Pennsylvania example sent to him by Zimmermann.

11 ***S. imbricatus*** n. sp.—Narrowly oblong, convex, black throughout and very densely clothed above with large broad ogival scales, which widely

overlap in a longitudinal direction, blackish-gray and whitish confusedly intermingled, the latter more prevalent toward the sides; scales of the under surface smaller and nearly white, extremely dense; recurved setæ sparse, dark brown and inconspicuous. *Head* densely squamulose, the vestiture decumbent; transverse sulcus distinct; beak in both sexes densely clothed almost throughout with short sparse setæ and large recumbent and close-set scales, tufted and erect at base, in the male short, just visibly bent, stout, scarcely longer than the head and prothorax, the antennæ inserted at apical two-fifths, in the female distinctly longer, evenly, distinctly arcuate, scarcely more slender, a little more than one-half as long as the elytra, with the antennæ inserted just beyond the middle; antennæ moderate, the second funicular joint nearly one-half longer than the third; basal joint not quite as long as the next three in the female, slightly shorter in the male. *Prothorax* very small and narrow, nearly as long as wide, with subparallel and very feebly arcuate sides, subapical constriction broad and feeble; apex four-fifths as wide as the base. *Elytra* at base very nearly twice as wide as the prothorax, a little more than three times as long, two-thirds longer than wide; sides straight and parallel to the middle, then narrowly parabolic, the sides in apical third strongly convergent and nearly straight; striæ fine, completely concealed by the large scales. Length 1.7–2.2 mm.; width 0.7–0.9 mm.

California (Majave); Arizona (Riverside). Mr. H. F. Wickham.

This species resembles *seriatus*, but is easily distinguishable by its still smaller subcylindrical prothorax, and very large imbricated scales of the upper surface. It was taken in considerable abundance and I have before me eight specimens.

12 ***S. silaceus*** n. sp.—Narrowly oblong-oval, moderately convex, black, the legs dull rufo-piceous, the tarsi blackish; vestiture consisting of moderately large, elongate-oval scales, extremely dense, widely overlapping, pale ochreous in color, feebly variegated with a slightly darker brown, finer and sparser in two wide approximate pronotal vittæ, which are thereby darker in tint; on the under surface whitish, broadly rounded and dense; recurved setæ stout but short and not very conspicuous. *Head* squamulose, the constriction distinct; beak in the male short, stout, dull, densely punctate, squamulose except beyond the antennæ, very feebly arcuate, subequal in length to the head and prothorax, with the antennæ inserted at apical third, in the female slightly longer, more slender and arcuate, smooth, polished and minutely, sparsely punctate in apical two-fifths, slightly longer than the head and prothorax and just visibly more than one-half as long as the elytra, with the antennæ inserted at apical two-fifths; basal fasciculate tufts rather distinct; antennæ short, the second funicular joint but slightly longer than the third. *Prothorax* very nearly as long as wide, the sides broadly, evenly arcuate, feebly convergent and very broadly, feebly sinuate near the apex. *Elytra* at base one-third to two-fifths wider than the prothorax, nearly three times as long, one-half longer than wide, the sides parallel and straight in basal half,



then gradually acutely ogival; striæ indicated by narrow partings of the vestiture. Length 1.4–1.7 mm.; width 0.6–0.7 mm.

Arizona.

The five specimens in my cabinet display scarcely any variation. This is one of the most minute species of the genus, and will be easily known by the characters given.

13 **S. spurcus** n. sp.—Rather broadly oblong-oval, moderately convex, black, the beak piceous; legs rufous, blackish near the base, the tarsi blackish; vestiture of the upper surface consisting of extremely dense, widely imbricated, pale ochreous-yellow scales, rather small in size, uniformly dense throughout the pronotum, scarcely visibly uneven in coloration on the elytra, nearly similar beneath and equally dense; recurved setæ stout, rather abundant but concolorous and not very conspicuous. *Head* densely squamose, the constriction rather feeble; beak in the female slender, distinctly, evenly arcuate, rather densely squamose in basal half but nude, polished, minutely, sparsely punctate thence to the apex, about three-fifths as long as the elytra; antennæ inserted at apical two-fifths, the second funicular joint but slightly longer than the third. *Prothorax* very nearly as long as wide, the sides broadly, feebly arcuate and gradually convergent, nearly straight and not perceptibly constricted anteriorly to the apex, the latter three-fourths as wide as the base; sculpture entirely concealed by the dense even crust of scales. *Elytra* at base fully one-half wider than the prothorax, three times as long, one-half longer than wide, the sides straight and parallel in basal half, then angulato-parabolic; striæ indicated only by narrow and rather ill-defined partings of the vestiture. Length 1.9 mm.; width 0.85 mm.

Texas.

The single female before me represents a species somewhat allied to *silaceus*, but decidedly different in its shorter, broader form, wider elytra, longer beak in the female and uniformly, densely covered pronotum.

14 **S. vestitus** Lee.—Proc. Am. Phil. Soc., XV, p. 172.

Rather narrowly oblong-oval, convex, blackish, the beak, antennæ, legs and elytra rufo-testaceous, the latter with the suture and base clouded with piceous; vestiture consisting of rather small elongate-oval yellowish scales, moderately dense, sometimes quite sparse, not mottled, intermixed with distinct recurved setæ. Beak in the male short, stout, feebly arcuate, tapering, smooth and nude toward apex, scarcely longer than the head and prothorax, with the antennæ inserted at apical two-fifths, in the female much longer, smooth, cylindrical, subglabrous and subimpunctate, slightly squamose toward base, evenly, moderately arcuate, rather more than one-half as long

as the elytra, with the antennæ inserted distinctly behind the middle; antennæ slender, the second funicular joint fully as long as the next two in the female, slightly shorter in the male. Prothorax nearly as long as wide, evenly rounded at the sides, feebly narrowed but scarcely at all constricted toward apex. Elytra at base one-half wider than the prothorax, a little more than three times as long, parallel in basal half, the sides broadly, feebly but distinctly constricted before the apex. Length 1.7–2.2 mm.; width 0.7–1.0 mm.

Kansas, Colorado and Montana. The tarsal claws in this distinct and easily recognizable species are unusually long and divergent but connate at base.

15 **S. sparsus** n. sp.—Oblong-oval, convex, deep black throughout, the vestiture of the upper surface consisting of small elongate-oval whitish scales, uniform throughout and very sparsely scattered over the elytra, the striæ indicated by partings which are wider than the grooves, rather denser, and wider beneath on the sterna and their side-pieces. Head subglabrous, alutaceous, finely but strongly reticulate; transverse constriction well marked, fine; beak in the male rather long, evenly cylindrical and somewhat thick throughout, feebly, evenly arcuate, sparsely but strongly punctate and subglabrous in apical half, finely and sparsely squamulose and more opaque toward base with the two fasciculate basal tufts small, distinctly longer than the head and prothorax and one-half as long as the elytra; antennæ inserted at the middle, the second funicular joint subequal to the next two. Prothorax slightly wider than long, the sides feebly convergent, broadly, evenly arcuate nearly to the apex, the subapical constriction not large but distinct; apex three-fourths as wide as the base; disk not very coarsely but deeply, closely and evenly punctate, the punctures not much obscured by the vestiture. Elytra at base one-half wider than the prothorax, three times as long, fully one-half longer than wide, parallel and nearly straight at the sides in basal half, then gradually ogival, not constricted before the apex; striæ fine, deep, consisting of narrow approximate linear punctures near the sides. Tarsal claws rather long, stout, pointed, distinctly divergent but completely connate at base. Length 2.5 mm.; width 1.1 mm.

#### Colorado.

The single specimen represents a species allied to *sordidus* and *griseus*, but differs in the small, widely-scattered scales and black legs. From the male of *sordidus* it differs in its much longer, non-tapering, sparsely squamulose beak, with the antennæ inserted at the middle. The male of *griseus* I have not at hand, but the female differs from the type of *sparsus* in its very much larger and more elongate prothorax.

16 **S. pleuralis** n. sp.—Robust, oblong-oval, convex, black, the legs red with the tarsi darker, extremely densely clothed above with large scales, abruptly white in lateral sixth of the pronotum and more than lateral fourth of the elytra, elsewhere above dark red-brown, smaller, whitish, very dense beneath; brown scales above easily denuded, the white more persistent. *Head* finely granulate, obscurely areolate; transverse impression feeble; beak rather slender, distinctly arcuate, strongly punctured throughout, opaque toward base, squamulose, the scales suberect laterally toward base, equal in length to the head and prothorax; antennæ inserted a little beyond the middle, the basal joint of the funicle about as long as the next two, second rather more than one-half longer than the third. *Prothorax* very nearly as long as wide; sides parallel, broadly, evenly arcuate, convergent and distinctly constricted very near the apex, the latter two-thirds as wide as the base; disk where denuded strongly, rather closely, evenly perforato-punctate, the interspaces narrow but smooth and polished. *Elytra* at base one-third wider than the prothorax, two and one-half times as long, not more than one-third longer than wide, nearly straight and parallel at the sides in basal half, then narrowly parabolic, with the convergent sides nearly straight; striæ fine, deep toward the middle when denuded. Length 2.0 mm.; width 1.0 mm.

#### Arizona.

A single specimen which is probably a female; the second ventral segment is minutely but quite distinctly angulated posteriorly at the sides.

#### 17 **S. obtectus** Lec.—Proc. Am. Phil. Soc., XV, p. 171.

Oblong-oval, convex, deep black throughout, polished when denuded, the pronotum then strongly, closely, evenly punctured; integuments densely clothed with rather large, deeply and coarsely strigose, elongate-oval scales, widely overlapping longitudinally on the elytra, dark brown in color, very feebly and indefinitely mottled with cinereous toward the sides; recurved setæ as usual. Beak in the male rather thick, feebly arcuate, densely squamose, opaque, scarcely longer than the prothorax, the antennæ inserted near apical two-fifths, in the female slightly thinner, nearly straight, as long as the head and prothorax, otherwise similar to that of the male, the antennæ inserted just visibly beyond the middle; basal squamulose tufts very prominent; antennæ moderate, the basal joint of the funicle subequal to the next three, second one-half longer than the third. *Prothorax* large and long, fully as long as wide, the sides parallel and broadly arcuate, becoming convergent and strongly constricted toward apex, the latter three-fourths as wide as the base. *Elytra* at base not more than one-third wider than the prothorax,

scarcely more than twice as long; sides parallel and straight in basal half, then narrowly parabolic; striæ fine, deep, strongly punctured laterally. Length 1.8–2.8 mm.; width 0.75–1.2 mm.

California (Los Angeles and San Diego). A very distinct species, easily identifiable by its large elongate prothorax. The vestiture is very easily abraded, and, out of a large series which I took at San Diego, there is scarcely a specimen having more than a few scattered scales on the upper surface. One specimen in my cabinet is labeled "Arizona."

18 **S. sordidus** Lec.—Proc. Am. Phil. Soc., XV, p. 173.

Oblong-oval, convex, black, the legs dull rufous; integuments densely clothed with moderately large, broadly oval scales, uniform in coloration, ochreous to cinereous on the upper surface, whiter beneath; recurved setæ small and distant. Beak in the male short, thick, nearly straight, feebly tapering from base to apex, coarsely, densely squamose except near the apex, coarsely punctate, scarcely longer than the head and prothorax, with the antennæ inserted a little beyond the middle, in the female long, very slender, equally, evenly cylindrical and feebly arcuate throughout, smooth, finely, sparsely punctate, squamose only very near the base, one-half longer than the head and prothorax and scarcely visibly shorter than the elytra, with the antennæ inserted somewhat behind basal two-fifths; antennæ slender, the second funicular joint slightly shorter than the next two. Prothorax distinctly narrowed from base to apex, broadly, rather strongly rounded at the sides, deeply constricted behind the apex, the latter three-fourths as wide as the base; disk convex, slightly wider than long. Elytra at base one-fourth to one-third wider than the prothorax, two and one-half times as long. Length 2.1–2.4 mm.; width 0.8–1.05 mm.

Texas. A rather small species, allied completely in the structure of the beak, both in the male and female, to *constrictus* (Desmoris). The original description is greatly in error in stating that the tarsal claws are not connate; they are rather long and completely connate in basal fourth. The head behind the transverse groove is abruptly and completely glabrous, highly polished, sometimes with merely a very feeble transversely wavy strigilation, while in *griseus* it is dull and strongly, coarsely reticulate.

19 **S. constrictus** Say.—Journ. Ac. Nat. Sci., Phila., III, p. 313; Ed. Lec. II, p. 176 (Rhynchænus); Lec.: Proc. Am. Phil. Soc., XV, p. 168 (Desmoris).



Oblong-oval, black, densely and uniformly clothed with elongate-oval appressed scales, cinereous to ochreous in color, each interval of the elytra with a single series of short robust recurved squamules.

This species is either one of the most variable of curculionides in structural peculiarities affecting parts of the body referred to by LeConte for generic characters, or the large series before me is made up of closely allied species which can only be differentiated by the collection of abundant material from carefully recorded localities. I will at present simply describe certain modifications noticed in three female types taken in Iowa, New Mexico and northern California respectively:

1—Beak fully one-half as long as the body, extremely slender; basal joint of the funicle barely as long as the next two, the second fully three-fourths as long as the first; legs, tarsi and antennæ pale rufous; beak rufescent.

2—Beak very long, nearly two-thirds as long as the body, thicker; basal joint of the funicle fully as long as the next three; second one-half as long as the first; legs, antennæ and beak throughout black.

3—Beak much shorter, stouter, two-fifths as long as the body; basal joint of funicle longer than the next two; legs rufous, the tarsi darker; beak and antennæ blackish, the club paler.

In the male the beak is very much shorter and thicker, densely punctate, squamose, with the antennæ inserted just beyond the middle. Length 2.2–4.0 mm.; width 1.0–1.8 mm.

Iowa to Arizona, northern California. A very abundant species; the smallest and largest in my series of thirty or more specimens are both females.

20 ***S. griseus*** Lec.—Proc. Am. Phil. Soc., XV, p. 171.

Narrowly oblong-oval, convex, black, the legs dark rufo-piceous; scales moderate in size, broadly oval, dark brownish and paler, dense but not overlapping on the upper surface, white and very dense beneath. Beak in the female very slender, cylindrical, just visibly bent, much longer than the head and prothorax and nearly two-thirds as long as the elytra, punctured, opaque and squamulose toward base, smooth and with small subelongate erosions toward apex; antennæ inserted slightly behind the middle, short, the scape not quite attaining the eye; second funicular joint but slightly longer than the third. Prothorax large, fully as long as wide, subparallel and broadly, evenly and strongly arcuate at the sides, rather

strongly but gradually narrowed and broadly, feebly constricted toward the apex, the latter three-fourths as wide as the base; disk convex, rather coarsely, deeply, densely punctate, widest behind the middle. Elytra at base scarcely more than one-fourth wider than the prothorax, just visibly more than twice as long, one-half longer than wide, parallel in basal half, then regularly, acutely ogival, not constricted before the apex; striæ deep but not very coarse. Tarsal claws rather small, nearly parallel, connate toward base. Length 2.3 mm.; width 0.9 mm.

Texas. Resembles *scapalis*, except in the color and disposition of the scales and in its very much smaller size.

21 **S. connivens** n. sp.—Oblong-oval, moderately stout and convex, piceous-black, the beak, antennæ and legs throughout rufous; vestiture very dense and uniform, consisting of moderately large, coarsely strigose, grayish-white scales, with intermixed recurved setæ, concolorous, dense and but slightly smaller on the under surface. Head not very densely squamulose, the constriction feeble; beak in the female very slender, gradually, just visibly thicker from the antennæ to the base, feebly, evenly arcuate, polished and impunctate in apical half, thence gradually more punctured, opaque and sparsely, finely squamulose to the base, much longer than the head and prothorax and about three-fifths as long as the elytra, the basal tufts composed of long slender squamules; antennæ inserted at the middle, the second funicular joint three-fourths as long as the first and about equal to the next two. Prothorax very nearly as long as wide, the sides broadly arcuate, gradually convergent, broadly and just visibly sinuate to the apex, the latter scarcely more than two-thirds as wide as the base; disk strongly, densely punctate and subrugose, the punctures tending strongly to coalesce. Elytra at base two-fifths wider than the prothorax, not quite three times as long, slightly less than one-half longer than wide, the sides straight and parallel in basal three-fifths, the apex evenly ogival; striæ indicated by coarse partings of the vestiture. Legs rather long and decidedly slender; tarsal claws as usual. Length 2.3 mm.; width 1.0 mm.

Missouri (St. Louis). Mr. Hugo Soltan.

A moderately small species, without any striking features, but evidently different from any other here brought to notice. It appears to combine certain of the characteristics of *sordidus* and *flavicans*, but differs from the former in its much shorter beak and medial antennæ in the female, and from the latter in the disposition of the vestiture. It is represented by a single female specimen.

22 **S. seriatus** Lec.—Proc. Am. Phil. Soc., XV, p. 172.

Oblong, rather convex, piceous, clothed densely with elongate-oval scales, yellowish and confusedly, feebly nubilate with white

above, especially at the base of the third interval, uneven in distribution near the suture, very dense and white throughout beneath; upper surface with the usual stout recurved setæ not especially prominent. Beak in the female rather long, punctate, decidedly squamulose except beyond the antennæ, very feebly, evenly arcuate and about three-fifths as long as the elytra; antennæ inserted at the middle, rather short, the second funicular joint but very slightly longer than the third. Prothorax small, as long as wide, the sides rounded, feebly convergent and quite distinctly constricted anteriorly, densely and confusedly squamose and setose. Elytra at base nearly one-half wider than the prothorax, about three times as long, one-half longer than wide; sides parallel and straight to the middle, then gradually narrowly parabolic; striæ fine, with large elongate punctures toward the sides; vestiture generally more denuded toward the middle. Length 1.75–2.5 mm.; width 0.7–1.0 mm.

California (Mariposa)—Cab. LeConte; Arizona and Texas. A small species, distinguishable by its small elongate prothorax and rather long beak, which is punctured and more or less squamulose almost throughout, even in the female. In the male it is short, very densely squamose and hispid, as long as the head and prothorax and with the antennæ inserted near apical third. It was taken in great abundance by Mr. Dunn at Benson, Arizona.

The Texan form identified by LeConte as *corniculatus*, belongs to this species.

23 ***S. fiducialis*** n. sp.—Oblong-oval, convex, rather shining when denuded, black, the legs rufous, blackish at base; elytra broadly pale and rufescent toward the sides; vestiture of the pronotum dense and squamiform at the sides, becoming sparser and fine toward the middle, that of the elytra dense and nearly uniform, consisting of elongate-oval, pointed, yellowish scales, more condensed and coarser in wavy subtransverse areas; on the under surface yellowish-white, the scales smaller and more rounded, dense. *Head* finely squamulose, the constriction deep, the two corniculate tufts long and conspicuous; beak in the male moderately thick, even throughout, not tapering, dull, punctate, deeply furrowed and feebly arcuate toward apex, a little longer than the head and prothorax, nearly one-half as long as the elytra; antennæ inserted at apical third, the second funicular joint but slightly longer than the third. *Prothorax* very nearly as long as wide, the sides broadly, evenly, not very strongly arcuate, moderately convergent, broadly and feebly sinuate toward apex; disk convex, rather coarsely, deeply, evenly and densely punctate, the punctures rounded and all distinct. *Elytra* at base scarcely two-fifths wider than the prothorax, two and one-half times as long, more than one-half longer than wide, evenly elongate-ogival throughout, the sides not

becoming quite parallel toward base; striæ fine, deep and abrupt toward the suture. Length 2.5 mm.; width 1.1 mm.

Iowa.

The only species with which this can be compared are *flavicans* and *scapalis*, but it differs greatly from the former in its longer prothorax, with even circular and distinct punctures and slender sparse squamules toward the middle; in *flavicans* the pronotum is coarsely, densely squamose throughout, and the sculpture consists of more or less pronounced oblique furrows, caused by the coalescence of the punctures. *Scapalis* is a much larger, stouter species, with different color and structure of the vestiture.

24 ***S. scapalis*** Lec.—Proc. Am. Phil. Soc., XV, p. 168 (Desmoris).

Oval, convex, black; legs dull-rufous, blackish toward base; vestiture consisting of ochreous-yellow scales, moderately dense and forming subtransversely wavy condensed areas on the elytra. In the male the beak is densely punctured, moderately slender, rather longer than the head and prothorax, the antennæ inserted slightly beyond the middle, the basal joint of the funicle equal to the next two; in the female it is slightly longer but scarcely more slender, smoother, almost straight, the antennæ inserted scarcely at all behind the middle, the basal joint of the funicle distinctly longer than the next two, the club longer and narrower. Prothorax very nearly as long as wide, widest behind the middle; sides broadly arcuate, convergent and sinuate toward apex; disk rather coarsely, deeply, densely punctate. Elytra at base about one-third wider than the prothorax, scarcely more than twice as long, the sides straight and parallel in basal third, then gradually ogival; striæ narrow, deep, abrupt, obscurely punctate at the bottom. Length 3.7–4.2 mm.; width 1.7–2.0 mm.

Illinois. One of the largest species of the genus, greatly resembling *flavicans* in the color and disposition of the elytral vestiture, but very different in its more elongate prothorax. It differs radically from *constrictus*, with which it has been associated, in the less pronounced sexual differences in the beak, and in the peculiar arrangement of the elytral scales.

25 ***S. flavicans*** Lec.—Proc. Am. Phil. Soc., XV, p. 171.

Oblong-oval, rather stout, convex, blackish, with the legs paler, densely clothed with oval scales, ochreous to white in color, strongly



mottled on the elytra and generally with a short whitish line at the base of the third interval. Beak in the male one-half as long as the elytra, very feebly arcuate, punctured and squamose, the antennæ inserted a little beyond the middle, the second joint of the funicle slightly longer than the third; in the female but very slightly longer, more slender, smooth, squamulose toward base, very feebly arcuate, the antennæ inserted slightly behind the middle, the second funicular joint as long as the next two. Prothorax slightly wider than long, the sides convergent but not noticeably constricted toward apex, the latter two-thirds as wide as the base. Elytra at base two-fifths wider than the prothorax, between two and three times as long, one-half longer than wide, the sides nearly straight and parallel in basal half; striæ fine. Length 2.3–3.0 mm.; width 1.0–1.5 mm.

Texas, Dakota and Indiana. A rather common species, above the average in point of size, and easily recognizable by the peculiar condensations of larger and paler scales on the elytra, the vestiture of which is, however, very dense throughout. In one male specimen the beak is not longer than the head and prothorax, and very much less than one-half as long as the elytra.

26 **S. congestus** n. sp.—Oval, convex, pale rufo-testaceous throughout, the elytral suture narrowly picescent; vestiture sparse and uneven, yellowish-white, consisting of fine slender sparse squamules, which become larger and squamiform in the condensed spots, of which there are several on the pronotum; elytra with large subtransverse wavy condensed areas; metasternum and abdomen sparsely clothed with very fine elongate squamules, the metepisterna densely squamose. Head with a few fine squamules anteriorly; constriction evident; beak in the male moderately thick, not tapering, feebly bent toward apex, opaque, sparsely squamulose, the basal tufts not well developed, longer than the head and prothorax and more than one-half as long as the elytra; antennæ inserted rather beyond apical third, slender, the second funicular joint scarcely longer than the third, both elongate and one-half longer than the fourth. Prothorax but slightly wider than long, subparallel and strongly, evenly arcuate at the sides, feebly narrowed and finely distinctly constricted near the apex; disk convex, rather coarsely, deeply and closely punctate, the punctures circular. Elytra at base one-third wider than the disk of the pronotum, two and one-half times as long, two-fifths longer than wide, ogival, the sides gradually becoming almost parallel and feebly arcuate toward base; striæ distinct. Length 2.0–2.2 mm.; width 1.0–1.15 mm.

Colorado; District of Columbia.

There is no species with which this can be regarded as closely allied. It somewhat suggests *tychioides*, but the pronotal sculpture is of an entirely different order, and it differs from any other form

known to me in the elongate third joint of the antennæ. The specimen from the District of Columbia exactly resembles the Colorado type, but has the beak still longer, two-thirds as long as the elytra, smoother, more evenly arcuate, with the antennæ inserted at apical two-fifths; it is without doubt the female.

27 **S. tychioides** Lec.—Proc. Am. Phil. Soc., XV, p. 171.

Oval, convex, shining, black, the elytra with a very feeble sub-lateral rufescent vitta; legs red, black near the coxæ; tarsi blackish; vestiture of the upper surface sparse and uneven, very fine and sparse on the pronotum, yellowish and condensed in uneven sub-transverse spots of coarse scales on the elytra, the interspaces thinly sprinkled with fine short squamules; under surface very densely clothed throughout with small rounded yellowish-white scales. Beak thick and gibbous toward base, strongly tapering, thin and smooth toward apex, evenly, rather feebly arcuate, slightly longer than the head and prothorax; antennæ inserted slightly beyond the middle, the second funicular joint nearly as long as the next two. Prothorax rather large, strongly convex, slightly wider than long, strongly rounded at the sides, the latter moderately convergent, broadly and just visibly sinuate near the apex; punctures reniform or lunate, small, rather sparse, becoming larger and rugose laterally, without trace of median line; interspaces polished, not reticulate. Elytra at base one-fourth wider than the prothorax, a little more than twice as long, one-third longer than wide, elongate-ogival, becoming almost parallel near the base. Length 2.2 mm.; width 1.1 mm.

Kansas. I am not certain of the sex of the single example before me, but the thick, strongly tapering beak would appear to indicate the male.

28 **S. sagittatus** n. sp.—Oblong-oval, convex, feebly shining, black, the antennæ piceous with the club paler; legs and tarsi pale rufous, coxæ darker; elytra black, with a broad pale rufous and oblique vitta on each from the humeri to the apex; vestiture almost entirely denuded in the type, but apparently sparse and uneven as in *tychioides*. Head dull, the constriction moderately strong; beak thick, dull, equal in diameter and extremely feebly evenly arcuate throughout, a little longer than the head and prothorax; antennæ inserted at apical third, the second funicular joint but slightly longer than the third. Prothorax moderate in size, convex, quite distinctly wider than long, the sides evenly, rather strongly rounded, convergent but scarcely constricted anteriorly; disk dull, the sculpture fine, not very deep, extremely

dense and peculiar, consisting of long oblique uneven eroded channels, which are evidently formed by the coalescence of reniform punctures of the *tychioides* type, but also with an even median line, entirely impunctate and finely granulato-reticulate. *Elytra* at base one-third wider than the prothorax, fully two and one-half times as long, one-half longer than wide, ogival in apical half, the sides thence straight and parallel to the base; humeri right, prominent but narrowly rounded; striæ deep, punctate toward the sides. Length 2.0 mm.; width 0.85 mm.

Rhode Island.

This species, while allied to *tychioides* and *sculpticollis*, is distinct from both in the narrow granulose clearly limited impunctate median line of the pronotum; the latter is larger than in *sculpticollis*, but smaller than in *tychioides*. It is represented by a single male example.

29 **S. sculpticollis** n. sp.—Narrowly oval, convex, feebly shining, black, the antennæ piceous, the legs red, darker near the coxæ, the tarsi piceous; elytra bright rufous, the suture broadly, suffusedly blackish; vestiture sparse and uneven, fine and sparse at the sides of the prothorax, confusedly mottled with condensed areas of larger yellowish-white scales and small sparse slender squamules on the elytra; under surface clothed sparsely with small elongate squamules, very dense on the met-episterna. *Head* dull, subglabrous; constriction very deep; beak in the male thick, dull, punctate, sparsely squamulose, evenly cylindrical, not tapering, evenly, feebly arcuate, distinctly longer than the head and prothorax, with the antennæ inserted just behind apical third, in the female slightly longer and smoother, evenly cylindrical, evenly, moderately arcuate, nearly three-fifths as long as the elytra, with the antennæ inserted at apical two-fifths; antennæ moderate, the second funicular joint much shorter than the next two. *Prothorax* small, slightly wider than long, convex, strongly, evenly rounded at the sides, feebly narrowed but scarcely at all constricted near the apex, very deeply, densely sculptured, the sculpture consisting of moderately small reniform punctures, close-set and often coalescent, with the narrow interspaces more or less punctulate, without trace of median line. *Elytra* at base one-half wider than the prothorax, fully two and one-half times as long, elongate-ogival, the sides becoming parallel and nearly straight in basal half; striæ distinct, obsoletely punctate. Length 2.1–2.25 mm.; width 0.9–1.0 mm.

Virginia; Indiana; Texas.

A common species, allied to *tychioides*, but abundantly distinct in its much smaller, more coarsely and densely sculptured prothorax and very different beak, also in the shorter second funicular joint, and sparser and narrow scales of the metasternum.

30 **S. instabilis** n. sp.—Oblong-oval, stout, convex, intense black, polished when denuded, the pronotum feebly alutaceous, with the punctures

rather small, not very deep and slightly oval, the interspaces finely punctulate; scales whitish, narrowly oval, dense; legs bright rufous, the tarsi darker. *Head* minutely punctate; constriction strong; beak rather thick, feebly arcuate, densely punctate in basal half, the apical regions sparsely so and shining, equal in length to the head and prothorax; antennæ inserted slightly beyond the middle, the basal joint of the funicle not quite as long as the next three, second one-half longer than the third. *Prothorax* large, not quite as long as wide, the sides rounded before the middle, thence feebly convergent and nearly straight to the base, very deeply constricted at some distance behind the apex, the latter tubulate and barely three-fourths as wide as the base; disk widest before the middle. *Elytra* at base two-fifths wider than the prothorax, two and one-half times as long, not quite one-half longer than wide, the sides straight and parallel in basal half, then narrowly parabolic; striae fine, deep, scarcely at all impressed and with elongate narrow punctures laterally. Length 2.0 mm.; width 0.9 mm.

California (Napa Co.).

The single specimen, which I took at Suscol Station, is almost entirely denuded above, with only a small spot of white scales near the middle of each elytron and others yellowish in color scattered thence to the apex; the two spots are unsymmetrical and therefore simply remnants of the vestiture; the specimen is probably a female. The beak is sparsely and rather finely setulose, with a small abrupt tuft of white squamules above each eye. This species is easily separable from *obtectus* by its shorter, more obese form and red legs, from *cinereus* by its large prothorax, and from both by the different sculpture of the pronotum.

31 ***S. cinereus*** Mots.—Bull. Mosc., 1845, II, p. 376; Lec.: Proc. Am. Phil. Soc., XV, p. 173.

Oblong-oval, convex, black throughout, the legs rarely with a feeble piceous tinge; integuments densely clothed with elongate-oval dark brown and cinereous scales, confusedly and not conspicuously mottled on the elytra, the surface polished black when denuded, the pronotum rather finely but very deeply and closely punctate, the punctures not in actual contact, perforate. Beak differing scarcely at all in the sexes, short, thick, strongly, densely punctate, sparsely squamulose, with two erect tufts at base, very feebly arcuate and but very slightly longer than the head and prothorax; antennæ inserted near apical third in the male and two-fifths in the female, the basal joint of the funicle fully as long as the next three, second barely longer than the third. Prothorax but slightly wider than long, the sides broadly arcuate, broadly, feebly constricted behind



the apex, the latter scarcely three-fourths as wide as the base. Elytra at base one-half wider than the prothorax, very nearly three times as long, one-half to three-fifths longer than wide, straight and parallel at the sides in basal half to three-fifths; striæ fine, deep, distinctly punctured toward the sides. Length 2.1–2.7 mm.; width 0.9–1.2 mm.

California (San Francisco), abundant. The commonest species of the middle coast regions of California, and easily known by the characters given. I cannot perceive that the elytra are notably elongate in this species, as remarked by LeConte, but the very feeble sexual difference in the beak is a distinguishing character.

32 **S. apionides** n. sp.—Narrowly oblong-oval, convex, deep black throughout the body, legs and antennæ; vestiture sparse, consisting of small remote setiform squamules on the elytra, with small sparse condensed spots of wider white scales, the latter also more abundant on the pronotum toward the sides; under surface sparsely and unevenly squamose. Head finely granulate-reticulate, the transverse impression feeble but distinct; beak in the male short, thick, feebly arcuate, dull and granulose, punctate, sparsely setulose, not fasciculate at base, very slightly longer than the head and prothorax, with the antennæ inserted just beyond the middle, in the female nearly similar, slightly longer, scarcely thinner or more arcuate, smoother and more shining throughout, distinctly longer than the head and prothorax and fully one-half as long as the elytra, with the antennæ inserted at the middle; antennæ moderate, the second funicular joint but very slightly longer than the third. Prothorax slightly wider than long, convex, the sides broadly, evenly arcuate, becoming more convergent and nearly straight near the apex, the latter three-fourths as wide as the base; constriction almost completely obsolete; punctures coarse, very deep, coalescent in threes or fours forming oblique sinuous lines. Elytra at base three-fifths wider than the prothorax, three times as long, three-fifths longer than wide, the sides nearly straight and parallel in basal half, the posterior half subacutely ogival; striæ rather fine, deep toward the suture but becoming simply series of coarse elongate punctures laterally. Length 1.6–1.75 mm.; width 0.65–0.7 mm.

North Carolina (Asheville).

A very distinct minute species, represented in my cabinet by a single pair. It may be recognized by the sparse and uneven vestiture, and the coarse deep and peculiar sculpture of the pronotum.

33 **S. perpusillus** n. sp.—Oblong-oval, convex, blackish-piceous; legs rufous with the tarsi darker; vestiture consisting of oval white scales, moderately large and generally not quite contiguous, and, on the pronotum, decidedly separated and varying in width; recurved setæ of the elytra fine distant and not conspicuous; scales of the under surface small, rounded, white, very nar-

rowly separated. *Head* scarcely shining, the frontal constriction very broad and feeble; beak slender, cylindrical, smooth and extremely minutely, feebly punctulate in apical half, punctate and sparsely squamose toward base, distinctly longer than the head and prothorax and nearly three-fifths as long as the elytra, evenly and distinctly arcuate; antennæ inserted at the middle, rather short, the second funicular joint but slightly shorter than the next two. *Prothorax* very nearly as long as wide, the sides broadly, evenly arcuate toward base, becoming slightly more convergent and nearly straight anteriorly, the constriction very feeble; punctures small, shallow and not dense; interspaces shining. *Elytra* at base one-half wider than the prothorax, two and two-thirds times as long, one-half longer than wide; sides nearly straight, and parallel in basal half, then convergent, the apex acutely rounded; striæ fine but deep. Length 1.6 mm.; width 0.6 mm.

#### Florida.

The unique type is a female and the species is not closely allied to any other known to me, being easily determinable by its small size and white scales, the latter close-set but generally not quite contiguous.

34 ***S. defricans*** n. sp.—Narrowly oblong-oval, convex, black, the legs dark rufous, the tarsi piceous; upper surface clothed unevenly with moderately large oval whitish scales, generally denser, or at least more persistent, in a broad line from the humeri to the middle of each elytron; stout recurved bristles short. *Head* dull, densely granulose; transverse impression rather feeble; beak opaque, shining and finely, deeply sulcate in apical half, sparsely setulose toward base, densely so above the eyes, very feebly arcuate, stout, tapering, as long as the head and prothorax; antennæ inserted at apical two-fifths, the basal joint of the funicle rather robust, as long as the next three, second nearly one-half longer than the third. *Prothorax* very nearly as long as wide; sides subparallel and broadly arcuate, convergent and very feebly constricted near the apex, the latter three-fourths as wide as the base; disk subopaque, finely, rather feebly and moderately densely punctate, the interspaces minutely, very densely, deeply punctulate. *Elytra* at base not quite one-half wider than the prothorax, scarcely three times as long; sides straight and parallel in basal three-fifths, then parabolically rounded; striæ fine but deep, the surface polished when denuded. *Legs* moderate, the tarsal claws very small, connate in basal half. Length 1.4–1.8 mm.; width 0.6–0.7 mm.

#### California (Lake and Monterey Cos.).

The three specimens in my cabinet exhibit but slight variability and are of uncertain sex; it is probable that the sexual differences in the beak are, however, very slight. This species is not closely allied to any other, and is easily distinguishable, among the Californian forms, by its minute stature.

35 **S. gibbistrois** n. sp.—Stout and convex, oval, black, the legs except near the base rufous; elytra pale rufous, narrowly blackish along the suture; upper surface sparsely and unevenly clothed with yellowish scales and fine slender squamules, the former dense at the sides of the pronotum toward base and narrowly along the middle, and on the elytra in subtransverse uneven spots and fasciæ; under surface moderately densely squamose. *Head* polished, the constriction evident; beak in the male moderately thick, very feebly, evenly arcuate, dull, densely punctate, strongly gibbous before the constriction, a little longer than the head and prothorax and about one-half as long as the elytra; antennæ inserted at apical two-fifths, the second funicular joint but slightly longer than the third. *Prothorax* moderately large, quite distinctly wider than long, the sides subparallel, broadly, rather strongly arcuate, convergent and broadly sinuate toward the apex, the latter three-fourths as wide as the base; disk convex, dull, very densely punctate, the punctures small, deep, lunate, the interspaces densely punctulate. *Elytra* at base not more than one-third wider than the prothorax, two and one-half times as long, about one-fourth longer than wide, just visibly wider behind the middle than at base, the sides straight, broadly parabolic in apical two-fifths, the striæ deep and distinct. Length 1.9 mm.; width 1.0 mm.

Delaware.

The single male represents a species allied somewhat to *sculpticollis*, but differing in its larger, more densely sculptured pronotum, much shorter elytra, gibbous beak and different vestiture, the sides of the pronotum being simply sparsely, finely squamulose, and the third elytral interval conspicuously squamose at base in *sculpticollis*.

36 **S. squalidus** n. sp.—Stout, strongly convex, oval, black, the legs dark rufo-piceous; vestiture of the upper surface dense, consisting of rather large imbricated scales, confusedly mottled whitish and piceous, the former generally predominating; scales of the under surface very small, rounded, yellowish-white and extremely dense; recurved setæ sparse and slender. *Head* feebly squamulose anteriorly, the constriction moderate; beak in the male thick, very feebly arcuate, rough, densely punctate, sparsely hispid and dull almost throughout, much longer than the head and prothorax and one-half as long as the elytra, with the antennæ inserted at apical third, in the female longer, more slender and arcuate, finely, rather densely punctate but shining and nearly glabrous in apical half, nearly three-fourths as long as the elytra, with the antennæ inserted at the middle; basal tufts not well developed; antennæ rather slender, the second funicular joint three-fourths as long as the first and equal to the next two in the female, very little shorter in the male. *Prothorax* rather large and inflated, the sides strongly arcuate, convergent and rather strongly constricted near the apex, the latter not more than three-fifths as wide as the middle; disk convex, rather coarsely, deeply, extremely densely punctured, one-fourth wider than long. *Elytra* at base not more than one-third wider than the prothorax, two and two-thirds times as

long, one-fourth longer than wide, distinctly wider at the middle than at base, parabolic in apical half. Length 2.3–2.7 mm.; width 1.2–1.4 mm.

Pennsylvania; District of Columbia; Indiana.

A common eastern form resembling *ovipennis* but much larger, with a relatively larger, more inflated prothorax, more elongate beak and longer second funicular joint. I found it labeled "*amœnus*" in my cabinet, a mistake which may possibly be common; *amœnus* is a widely different species, with the prothorax scarcely perceptibly narrower than the base of the elytra. One specimen before me is labeled "Arizona," but perhaps erroneously.

37 ***S. ovipennis*** Lec.—Proc. Am. Phil. Soc., XV, p. 170.

Oval, strongly convex, stout, black, the legs rufescent; scales of the upper surface moderately large, very dense, confusedly mottled with whitish and different shades of brown or piceous, the white scales usually more numerous and forming a distinct line at the base of the third interval. Beak in the male rather stout, densely squamose, a little longer than the head and prothorax; antennæ inserted at apical two-fifths, the second funicular joint but slightly longer than the third. Prothorax small, slightly but quite distinctly wider than long, the sides evenly, rather strongly arcuate, convergent and very feebly constricted anteriorly, the apex fully three-fourths as wide as the base; disk densely, strongly punctate. Elytra at base nearly one-half wider than the prothorax, almost three times as long, barely one-fourth longer than wide, distinctly wider in the middle than at base, gradually, acutely ogival in apical half; striæ indicated by coarse and uneven partings of the vestiture. Length 1.8–2.0 mm.; width 0.8–1.1 mm.

Texas to Montana. The measurement given in the original description is slightly too great.

#### **PROMECOTARSUS** n. gen.

I have separated under this name three species closely allied to *Smicronyx*, but differing in the longer, more glabrous tarsi, having a smaller third joint, with the fourth joint very long and subequal in length to the entire remainder. In general appearance the species are more cylindrical than in *Smicronyx*, and more nearly resemble *Endalus*. The principal characters may be expressed as follows:—

Body cylindrically convex, the elytra but very slightly wider than the prothorax, the vestiture dense, consisting of small, imbricated, almost completely



non-strigose scales, with a series of recurved, subrecumbent setæ on each stria interval. Beak constricted at base, the head nearly spherical, eyes as in *Smicronyx*. Prothorax constricted at apex, the ocular lobes more or less distinct. Scutellum very small. Prosternum deeply sinuate at apex. Metasternum as long as the first ventral segment. Abdomen flat, sutures two to four equally and feebly recurved at the sides, the second segment barely as long as the next two and not quite as long as the fifth. Legs, excepting tarsal structure, nearly as in *Smicronyx*.

In this genus, which constitutes one of the intermediate forms connecting *Smicronyx* with the *Hydronomi*, the claws are long and generally widely divergent, but in one species become subparallel; they may be described as connate very near the base, with the suture distinct. Promecotarsus is clearly, therefore, a transitional form but must be classed with *Smicronyx*, these two genera constituting the group *Smicronychi*.

The species may be easily known as follows:—

Ungues widely divergent; prothorax very nearly as long as wide; ocular lobes not prominent.

Prothorax abruptly, deeply constricted near the apex, the latter but slightly narrower than the base.....1 **maritimus**

Prothorax gradually more strongly narrowed and broadly, feebly constricted toward apex, the latter scarcely more than two-thirds as wide as the base.

2 **densus**

Ungues subparallel; prothorax much wider than long, with the ocular lobes prominent.....3 **fumatus**

1 **P. maritimus** n. sp.—Subcylindrical, convex, piceous, the legs feebly rufescent with the tarsi black; vestiture very dense, pale, the broad recurved squamules very short and subrecumbent. *Head* shining, glabrous, the transverse groove deep; beak in the male moderately thick, densely, rugosely punctate, sparsely squamulose, abruptly, strongly bent at the antennæ, thence more shining and feebly tapering to the apex, fully as long as the head and prothorax; antennæ inserted at apical third, the funicle long, the basal joint as long as the next two, second almost as long as the third and fourth, outer joints a little longer than wide, not noticeably thicker, club very slender, fusiform, the basal joint almost glabrous. *Prothorax* nearly one-fourth wider than long, parallel and broadly, evenly, rather strongly arcuate at the sides, deeply constricted behind the apex, the latter transversely truncate and but slightly narrower than the base; disk feebly convex, very densely, not coarsely, subrugosely punctate. *Elytra* at base but slightly wider than the prothorax, rather more than twice as long, fully two-fifths longer than wide, the sides subparallel and nearly straight in basal three-fifths, the apex narrowly parabolic; striæ deeply impressed. *Legs* moderate, the tarsi as long as the tibiae. Length 2.0–2.2 mm.; width 0.8–0.95 mm.

California (San Diego). Mr. Chas. Fuchs.

The three specimens in my cabinet are males, and the beak is probably much longer and more evenly arcuate in the female. This species somewhat resembles *densus*, but is smaller, narrower and differs greatly in the form of the prothorax, as well as in the somewhat longer second joint of the antennal funicle.

2 **P. densus** n. sp.—Robust, subcylindrical, convex, black, extremely densely clothed with rather small, broadly oval, yellowish-white and uniform scales, which are widely overlapping, granulose in texture and not strigose, similar in structure and density on the under surface; recurved setæ distinct. *Head* glabrous, finely, strongly reticulate; constriction fine, deep; beak in the female slender, polished, exceedingly finely, remotely punctate, but thicker, dull and rugosely punctate near the base, nearly evenly and quite strongly arcuate, almost three-fifths as long as the elytra; antennæ inserted scarcely beyond basal third, rather long and slender, the second funicular joint about as long as the next two; club moderately robust, very sparsely pubescent and shining toward base. *Prothorax* but slightly wider than long, the sides parallel and very feebly arcuate in basal two-thirds, then moderately convergent and broadly constricted to the apex, the latter rather more than two-thirds as wide as the base; disk moderately convex, evenly, densely squamose, finely, very densely punctate throughout. *Elytra* at base but slightly more than one-fourth wider than the prothorax, not quite two and one-half times as long, one-half longer than wide, the sides parallel in basal three-fifths, then narrowly angulato-parabolic; striæ indicated by fine but sharply defined partings of the dense crust of scales. *Legs* somewhat stout, the tarsi long and slender, the third joint only moderately dilated, the last joint long; claws long, divergent, connate at base. Length 2.5 mm.; width 1.05 mm.

Nebraska.

Easily distinguishable by the dense and uniform crust of non-strigose imbricated scales and the subcylindrical form, as well as by the characters given in the table.

3 **P. fumatus** n. sp.—Moderately robust, convex, subcylindrical, black throughout, extremely densely clothed with a crust of widely overlapping, dark, yellowish-gray scales, uniform in color, very broad and excessively minutely, indistinctly strigilate; recurved setæ fine but distinct. *Head* glabrous, minutely, feebly reticulate and rather strongly shining, the constriction fine but moderately deep; beak in the male thick, evenly cylindrical, distinctly arcuate, moderately densely punctate, not quite as long as the head and prothorax, with the antennæ inserted just beyond the middle, in the female a little more slender, evenly, distinctly arcuate, smooth and remotely punctulate except near the base, scarcely visibly longer than the head and prothorax, barely one-half as long as the elytra, with the antennæ inserted at basal two-fifths; antennæ moderately slender, the second funicular joint as long as the

next two; club slender, gradually, acutely pointed, rather densely pubescent. *Prothorax* transverse, one-third to two-fifths wider than long, the sides parallel, broadly, evenly arcuate in basal two-thirds, then strongly convergent and deeply, abruptly constricted, the apex transverse between the very prominent ocular lobes; disk very densely squamose, the sculpture dense and subrugose when denuded. *Elytra* at base between one-third and one-fourth wider than the prothorax, fully three times as long, one-half longer than wide, the sides parallel and nearly straight in basal three-fifths; striæ indicated by clearly defined narrow partings of the vestiture. Length 2.2–2.3 mm.; width 0.95 mm.

Montana (Helena). Mr. H. F. Wickham.

Closely allied to *densus*, but differing in its much shorter prothorax, shorter beak in the female, with the antennæ distinctly less basal, in its gray and not ochreous vestiture and in many other minor characters. It was taken in abundance, and the six specimens before me are very uniform in size.

#### TYCHINI.

#### TYCHIUS Schönh.

In subdividing the comparatively few American representatives of this genus, I have made use of some characters which do not exist among the European species, or at least, which have apparently not been mentioned in systematic works. Our species may be readily divided into four subgeneric groups as follows:—

Antennal funicle 7-jointed.

Body more or less robust and oval, the elytral intervals entirely devoid of recurved setæ .....**I**

Body narrower, oblong; elytral intervals with recurved semi-erect setæ...**II**

Antennal funicle 6-jointed.

Body elongate-oval, with robust recurved setæ, the entire facies almost as in group II; eyes large, very nearly circular .....**III**

Body much smaller, the species generally minute, with or without erect setæ; eyes more or less transversely fusiform .....**IV**

None of these divisions seems to correspond exactly with the European *Miccotrogus*, although I am not certain of the habitus of that subgenus, specimens sent to me by M. Desbrochers under the name *M. picirostris* having the antennal funicle certainly 7-jointed. It can be confidently affirmed, however, that the structure of the funicle is without full generic significance in our species, for the reason that groups II and III agree so satisfactorily in all other structural features. At the same time, there is sufficient heterogeneity to warrant a division into subgenera on the lines above

suggested. There is nothing to indicate that *Miccotrogus* possesses greater systematic value than any one of these American groups.

The species may be easily recognized by the following characters:—

Subgenus I.

Elytral vestiture narrowly vittate, often alternating fulvous and cinereous on the intervals, the striae broadly visible; anterior tibiae of the male strongly, acutely toothed internally near the middle .....1 **lineellus**

Elytral vestiture nearly uniform in color, the striae indicated by fine and indistinct partings; anterior tibiae not dentate in the male.

Beak thick, only feebly diminishing in diameter from base to apex.

Body broadly oval, the scales very narrow and hair-like.....2 **sordidus**

Body more narrowly oval, the scales broader and more densely crowded.

3 **tectus**

Beak thick at base, rapidly and finely attenuate toward apex; elytral vestiture mingled with a very few widely scattered rounded scales toward apex.....4 **arator**

Subgenus II.

Abdomen with sparse semi-erect setae, in addition to the dense squamosity.

Setae borne by the striae punctures of the elytra long semi-erect white and conspicuous.

Prothorax less transverse, with a broad median vitta which is entirely clothed with large white imbricated scales; setae throughout the body robust.....5 **soltai**

Prothorax strongly transverse, with a very fine white median line which contains no large non-strigose scales, except in the broader portion near the base; setae throughout longer and fine.....6 **hirtellus**

Setae borne by the striae punctures short, thicker, recumbent and inconspicuous.....7 **aratus**

Abdomen densely squamose but without trace of setae; scales of the elytra smaller and more densely imbricated along the suture than elsewhere.

Beak very feebly narrowed toward apex; prothorax a little less transverse, wider at the middle than at base; elytra with many more setae than scales on the disk.....8 **semisquamosus**

Beak rapidly and finely acuminate, thicker toward base; body stouter; sides of the prothorax parallel behind; elytra with many more large whitish oval scales than setae.....9 **lamellosus**

Subgenus III.

Beak short, feebly tapering from base to apex; elytra with large imbricated scales and very robust recurved fulvous setae.....10 **prolixus**

Subgenus IV.

Elytra without long erect bristles, although sometimes with abundant short strongly recurved setae, which are not very conspicuous.



- Vestiture finely and feebly variegated in color, and with a large sutural spot of white imbricated scales behind the scutellum...11 **variegatus**
- Vestiture nearly uniform in color, the scales of the upper surface all narrow and elongate, the squamules borne by the stria punctures similar to the others or very nearly as wide.
- Elytral intervals each with a single nearly even series of narrow scales, fulvous to white in color .....12 **simplex**
- Elytral intervals confusedly clothed with scales throughout their width.
- Elytral scales evenly but not very densely distributed, narrow and slender, ochreous-yellow in color, the middle scales of each interval semi-erect, especially toward apex.....13 **sibinioides**
- Elytral scales broader and more closely recumbent, denser along the suture, more broadly so behind the middle.....14 **mica**
- Elytra with stiff straight and strongly hispid erect or inclined setæ.
- Elytra with large rounded or oval whitish scales, unevenly distributed.
- Elytral setæ long and rather slender .....15 **setosus**
- Elytral setæ short, broad and scale-like.....16 **subfasciatus**
- Elytra with long slender white and fulvous decumbent squamules, entirely without rounded scales; erect setæ rather fine and much more numerous.
- 17 **hispidus**

The species of groups I and IV are generally taken in abundance when discovered, while those of II and III are apparently much less plentiful in individuals, or possibly less gregarious; they are also a little more closely allied among themselves, forming a more difficult study.

## I

### 1 **T. lineellus** Lec.—Proc. Am. Phil. Soc., XV, p. 217.

Broadly oval, strongly convex, rather densely clothed above with long, slender, coarsely strigose scales, which are variable in color, and, to some extent also, in distribution; in the best marked specimens they are subcupreous in two broad pronotal vittæ, and on the alternate intervals of the elytra, elsewhere cinereous, but often cinereous throughout; on the under surface they are whitish, broader, non-strigose and feathery in structure. The male has the beak short, abruptly tapering beyond the antennæ, and the anterior tibiæ strongly, acutely toothed internally just beyond the middle; in the female the beak is longer, nearly straight, slender but abruptly thicker very near the base. Length 3.7–4.7 mm.; width 1.7–2.2 mm.

California (Siskiyou to San Diego). This is a common species throughout the State.

**2 T. sordidus** Lec.—Proc. Am. Phil. Soc., XV, p. 217.

Robust, oval, convex, rather densely and uniformly clothed throughout with small slender scales, silvery gray to yellowish in color, and generally a little more condensed along the elytral suture; erect setæ completely wanting. Beak rather short, slender, straight, cylindrical, feebly tapering and slightly bent near the apex, barely as long as the prothorax, finely, densely punctate, squamulose and more or less carinulate; antennæ inserted at apical third, rather slender, the second funicular joint but slightly shorter than the first, slender, outer joints barely perceptibly wider, the club rather elongate, obliquely pointed at apex, rounded at base, almost equally trisected by two straight sutures. Prothorax slightly wider than long, the sides rapidly convergent from base to apex, broadly and evenly arcuate, constricted behind the apex, the latter scarcely more than one-third as wide as the base, the punctures circular, deep and dense. Elytra parallel, broadly rounded behind, one-fourth longer than wide, much wider than the prothorax and more than twice as long. Posterior femora feebly toothed. Length 4.0–4.7 mm.; width 2.1–2.4 mm.

Iowa and Illinois. Our largest species, sufficiently common and very readily recognizable by the characters given. The three specimens before me are probably males; in the female, the antennæ are undoubtedly less apical.

**3 T. tectus** Lec.—Proc. Am. Phil. Soc., XV, p. 217.

Oblong-oval, convex, black, the antennæ rufescent; body covered densely throughout with yellowish-white scales, whitish along the suture and middle of the pronotum and also toward the sides of the body; scales rather wide but parallel and subelongate, strigose. Beak evenly, moderately arcuate, subcylindrical, feebly tapering only very near the apex, finely, densely punctured throughout, densely squamulose but nude beyond the antennæ, in the male much shorter than the prothorax, with the antennæ inserted near apical third, in the female much longer, as long as the prothorax, with the antennæ inserted at the middle; antennæ slender, the basal joint of the funicle as long as the next three, second slightly longer than the third. Prothorax in the male two-fifths wider than long, with the sides inflated before the middle and the apex less than one-half as wide as the base, in the female longer, one-fourth wider than long, with the sides parallel and nearly straight, the apex more than one-

half as wide as the base. Elytra three-fifths longer than wide, scarcely wider than the disk of the prothorax in the male but distinctly wider in the female, the sides subparallel in basal three-fifths; intervals without median line of squamules, the hairs of the stria punctures white and quite evident. Length 2.6–3.7 mm.; width 1.15–1.7 mm.

Colorado and Montana. Numerous specimens. In one female, not otherwise differing, the beak is deformed, the apical parts being swollen polished and impunctate, separated from the post-antennal portion by a broad depression. The same deformity exists to a less marked degree in a male specimen, and the species seems to be peculiarly liable to this kind of rostral malformation. An extremely feeble transverse impression at the antennæ is however apparently normal in some species, such as *aratus* Say.

4 **T. arator** Gyll.—Sch. Curc., III, p. 414; Lec.: Proc. Am. Phil. Soc., XV, p. 216.

Oblong-oval; rather stout, convex, black, the legs piceous; antennæ and apical parts of the beak rufo-testaceous; body very densely clothed throughout with elongate dark ochreous scales, which are coarsely strigose, but intermixed with a few larger ones, toward the apex of the elytra, which are non-strigose in structure and rather paler in color; intervals of the elytra without setæ, the stria squamules distinct. Beak thick, tumid, densely punctured and squamulose behind, but very thin, glabrous, shining and sparsely punctured before, the point of antennal insertion, feebly arcuate, the thin apical portion straight, rather shorter than the prothorax in both sexes but a little longer in the female than in the male, the antennæ inserted at the middle in the former and at apical two-fifths in the latter, with the basal joint of the funicle as long as the next two, the second two-thirds as long as the first. Prothorax two-fifths wider than long, the apex much less than one-half as wide as the base. Elytra distinctly wider than the prothorax in both sexes, one-half longer than wide. Length 3.0–3.6 mm.; width 1.4–1.7 mm.

Texas (Dallas)—Mr. Wickham; Illinois—Cab. LeConte. This species is very isolated in all of its characters, and cannot be compared with any other known to me. The hind femora are feebly toothed beneath.

## II. .

5 **T. soltaui** n. sp.—Narrowly oblong-oval, moderately convex, black, the antennæ and tip of beak rufous; vestiture complex, consisting, on the beak, of slender semi-erect hispid squamules, recumbent behind an abrupt transverse line at the posterior margin of the eyes; on the pronotum, of slender dark fulvous squamules, partly erect and hispid, mingled, in a narrow line near the sides, with large whitish scales and with a broad median vitta, entirely composed of broad white scales; on the elytra of large dense imbricated scales and semi-erect robust recurved setæ, the latter disposed in single lines, the stria setæ also distinct; on the under surface of large oval white scales, generally concave along the middle, mingled with stout sparse setæ on the abdomen. *Head* densely clothed with recumbent fulvous scales behind the transverse hispid line; beak in the male stout, rapidly, finely acuminate, nude beyond the antennæ, nearly straight and scarcely as long as the prothorax; antennæ inserted near apical third, the basal joint of the funicle not quite as long as the next three, seventh much wider than the sixth. *Prothorax* one-fourth wider than long, very slightly wider before the middle than at base, the sides rounded convergent and distinctly constricted anteriorly, the apex nearly three-fifths as wide as the base; punctures very dense, entirely concealed. *Elytra* barely one-fourth wider and two and one-half times longer than the prothorax, the sides becoming straight and parallel toward base, obtusely rounded at apex. Posterior femora rather slender, obtusely and feebly toothed. Length 2.6 mm.; width 1.1 mm.

## Wyoming (Laramie).

A rather narrow species, allied to *hirtellus* and differing in the broad vitta of white scales along the middle of the pronotum, the more elongate prothorax, shorter, much coarser semi-erect setæ above and on the abdomen, and in the generally narrower form of the body. The single male was taken by Mr. Hugo Soltau.

6 **T. hirtellus** Lec.—Proc. Am. Phil. Soc., XV, p. 218.

Oblong-oval, moderately convex, piceous, the antennæ and tip of beak rufous; vestiture complex, consisting of dark brownish-fulvous narrow strigose squamules on the pronotum, largely replaced toward the sides by oval pointed non-strigose scales, strongly imbricated and not quite recumbent, again darker along the middle of the flanks beneath, narrowly white along the median line, more broadly toward base; on the elytra the vestiture consists of moderately large oval pointed pale brownish scales, strongly imbricated throughout, rather smaller, still denser and more ochreous on the sutural interval, the striæ indicated by fine partings in the dense crust, with the white hairs borne by the stria punctures distinct;



intervals each with a single series of long stiff erect but rather fine setæ; on the under surface the scales are whitish and very dense throughout, intermixed with long setæ on the abdomen. Beak in the male short, thick, densely hispid-squamulose, nude and polished near the apex, subequal in length to the prothorax, the antennæ inserted near apical third. Prothorax nearly one-half wider than long, the sides strongly evenly arcuate, convergent and strongly constricted near the apex, the latter about one-half as wide as the base. Elytra one-fourth wider than the prothorax and very nearly three times as long, broadly angulato-emarginate at base. Posterior femora obsoletely dentate. Length 2.9 mm.; width 1.25 mm.

Texas. Readily known by its complex vestiture, transverse prothorax, and fine long and semi-erect setæ. The fifth ventral segment is deeply and rather widely impressed or excavated in the male.

7 **T. aratus** Say.—Curc., p. 26; Ed. Lec. I, p. 294.

Oblong-elongate, convex, black, the legs, antennæ and tip of beak rufescent; body densely clothed throughout with scales of various forms and colors; those of the beak robust and hair-like, usually more or less bristling near the point of antennal insertion; those of the pronotum slender, strongly strigose, converging obliquely backward, fulvous, but whitish along the middle and laterally near the base; those of the elytra very large, broad, widely imbricated, granulose and not at all strigose in structure, and of various shades of gray and blackish, confusedly intermingled; intervals of the elytra each with a single series of long coarse bristling recurved setæ. Beak scarcely longer than the prothorax, just visibly arcuate, very feebly tapering from base to apex, slightly constricted at the antennæ, the apical portion nude and shining; antennæ with the first funicular joint as long as the next two. Prothorax one-half wider than long, the apex rather abruptly narrowed and constricted, less than one-half as wide as the base. Elytra at base one-fourth wider than the prothorax, two and two-thirds times as long, three-fifths longer than wide, the sides subparallel and straight in basal three-fifths, evenly, obtusely rounded behind. Posterior femora rather slender, strongly, obtusely prominent beneath at apical fourth, and with the usual subapical emargination. Length 3.3 mm.; width 1.4 mm.

Montana. The type specimen, which appears to be a male, agrees so thoroughly with the description of Say, that there can be little doubt of its representing the true *aratus*. It is unfortunate, however, that there should be two names in the same genus and within the same faunal limits which are mutually so similar. The term "olivaceous," applied by Say to the color of *aratus*, might have wide limits of meaning.

8 **T. semisquamosus** Lec.—Proc. Am. Phil. Soc., XV, p. 217.

Narrowly oblong-oval, rather convex, piceous, the legs, antennæ and tip of beak rufescent; vestiture complex, consisting of narrow elongate fulvous squamules on the pronotum, which become broad white scales in the middle and at each side but only near the base, anteriorly there are also some widely scattered large brown scales; on the elytra the intervals are clothed throughout with stout recurved and subrecumbent brown setæ, among which there are very sparsely strewn large dark gray-brown scales, the latter dense imbricated and reddish along the sutural interval; on the under surface the scales are whitish, elongate-oval and dense throughout. Beak in the male short, thick, not as long as the prothorax, feebly tapering from base to apex, densely squamulose except near the tip, the antennæ inserted at apical two-fifths, the basal joint of the funicle very stout, not as long as the next three, second but slightly longer than the third, narrow at base, three to seven subequal, moniliform; club abrupt, oblong-oval. Prothorax very nearly as long as wide, the apex three-fifths as wide as the base, finely and feebly constricted. Elytra at base scarcely one-third wider than the prothorax, three times as long, the sides straight and parallel in basal two-thirds; striæ fine, impressed, with the white squamules distinct. Length 2.5 mm.; width 1.0 mm.

California. This species can be easily identified by the narrow form, sparse scales of the elytra except along the suture, and absence of erect ventral hairs. The large scales of the upper surface are, as usual, granulose in structure and not strigate.

9 **T. lamellosus** n. sp.—Rather broadly oblong-oval, convex, piceous, the tibiæ, antennæ and tip of beak rufescent; vestiture dense and varied, consisting on the pronotum of long narrow fulvous strigose squamules, gradually intermixed toward the sides and almost replaced by large whitish scales, also narrowly along the middle, more broadly toward base; on the elytra the non-strigose scales are very large, broad, ogival, pearly white in color, dense

along the middle and lateral edge of each elytron, also dense and more yellowish along the sutural interval; recurved fulvous setæ rather abundant; on the under surface the scales are elongate-oval, whitish and dense. *Head* and beak very densely, finely squamulose, the latter short, very stout, strongly tapering from base to apex, with the portion beyond the antennæ very thin, nude and shining, feebly arcuate, in the male not more than three-fourths as long as the prothorax, with the antennæ inserted just behind apical third, the first joint of the funicle very stout, pedunculate at base, not as long as the next three, second one-half longer than the third, seventh a little larger than the sixth. *Prothorax* very nearly as long as wide, the sides parallel and nearly straight in basal two-thirds, then broadly rounded, convergent but scarcely at all constricted to the apex, the latter about one-half as wide as the base; disk densely, not coarsely punctate. *Elytra* at base rather more than one-fourth wider than the prothorax, not quite three times as long, the sides parallel and nearly straight in basal three-fifths; striæ very fine. *Legs* moderate, the hind femora feebly dentate, emarginate near the apex. Length 2.8 mm.; width 1.3 mm.

#### Utah.

The single male before me represents a species allied to *semisquamosus*, but differing in its more robust form, much more abundant and whiter scale-like plates of the elytra, relatively narrower apex of the prothorax, more rapidly and finely acuminate beak, and in several other characters. The fifth ventral segment has in the center a small deep punctiform fovea, which is not visible in the male of *semisquamosus*.

### III.

10 **T. prolixus** n. sp.—Oblong-elongate, convex, blackish, the antennæ and tip of beak paler; vestiture very dense throughout, consisting, on the pronotum, of long slender subrecumbent and strigose squamules, pale fulvous in color but whitish along the middle and near the sides toward base, not intermixed with more slender and erect setæ but with a few broad non-strigose scales in the whitish areas, though only near the base; on the elytra the scales are very large, dense, rounded, finely granulose in texture, widely imbricated and dark reddish-gray in color, each interval with a single uneven series of very coarse strongly recurved reddish pointed setæ; the under surface is densely clothed with elongate-oval concave and whitish scales. *Head* squamose; eyes rather large, almost perfectly circular; beak in the male thick, densely hispid-squamose and with a prominent tuft above each eye, almost straight but bent at base, rather rapidly narrowed, glabrous and shining beyond the antennæ, barely equal in length to the prothorax; antennæ inserted at apical two-fifths, the first funicular joint rather longer than the second and third, which are subequal and each distinctly longer than wide. *Prothorax* one-fourth wider than long, the sides just visibly convergent and broadly, feebly arcuate from the base nearly to the apex, then rather abruptly, deeply

constricted, the apex rather more than one-half as wide as the base. *Elytra* one-third wider than the prothorax and not quite three times as long, the sides parallel and straight in basal two-thirds; apex obtuse, with a small sutural notch. *Legs* long and rather slender, the hind femora feebly, obtusely prominent beneath at apical fourth. Length 3.3 mm.; width 1.35 mm.

#### Nevada.

The six-jointed antennal funicle isolates this species from all others which it most resembles in external aspect. The single type specimen is a male, and has the fifth abdominal segment scarcely impressed but longer than the two preceding together, the second suture flexed strongly backward at the sides extending a little beyond the anterior margin of the fourth segment, the third and fourth sutures scarcely at all bent at the sides.

#### IV.

11 **T. variegatus** n. sp.—Robust, oblong, rather convex, blackish, the antennæ and beak slightly paler; vestiture above not very dense, on the pronotum not altogether concealing the punctures and consisting of short very coarse pointed fulvous and white setæ, replaced by large white scales in the middle near the base and toward the sides; on the elytra, of very short stout subrecumbent setæ, fulvous and whitish in color, white and denser on the subapical umbones, and replaced by large imbricated white scales in a small elongate spot behind the scutellum, also more narrowly and indistinctly, in a small sutural line at the apex; under surface and legs clothed throughout very densely with white scales, sometimes feebly variegated with pale brown. *Head* and beak extremely densely squamose, the scales above usually dark ochreous-red, but whiter along the sides, the impressed line behind the eyes distinct, the eyes wider than long; beak extremely thick but rapidly tapering and subglabrous toward the tip, feebly arcuate, about as long as the prothorax in the male, with the antennæ inserted at apical third, scarcely longer in the female but with the antennæ inserted just beyond the middle; antennæ moderate, the first funicular joint fully as long as the next two, second a little longer than the third, both elongate, fourth shorter, club rather small. *Prothorax* one-third wider than long, the sides broadly, evenly arcuate, becoming parallel toward base, convergent and deeply constricted near the apex, the latter nearly two-thirds as wide as the base; punctures very coarse, deep, moderately dense. *Elytra* fully one-third wider than the prothorax, scarcely more than twice as long, one-fourth longer than wide, subparallel, obtuse at apex, with a small cuspid form sutural notch; striæ very coarse, crossed transversely at the bottom by rather distant ridges. Hind femora not at all prominent beneath. Length 2.0–2.4 mm.; width 0.9–1.2 mm.

Arizona (Benson); Texas (El Paso). Mr. G. W. Dunn.

The large series before me indicates but slight variability, and the characters given above will readily serve to identify this species,



which is the largest and one of the most isolated of the small forms peculiar to the desert regions of Arizona.

**12 *T. simplex*** n. sp.—Oblong-oval, rather convex, piceous, the elytra more or less rufescent; beak rufous except near the base; vestiture moderately dense, on the head and basal parts of the beak consisting of oval dense closely recumbent and very small scales, on the pronotum of rather sparse slender cinereous or more or less fulvous squamules, generally with sparsely scattered oval scales toward the sides, on the elytra of slender cinereous or cinereous and fulvous squamules, posteriorly recurved and subrecumbent in a single series on each interval, with scattered rounded scales toward the sides, the squamules of the striae punctures coarse and distinct, the upper surface otherwise glabrous; under surface densely clothed with small broadly oval whitish scales. *Head* moderate in convexity, the transverse line at the posterior limit of the eyes distinct, the eyes small transversely fusiform; beak moderately thick, feebly tapering, tumid above near the base, glabrous and shining beyond the antennæ, feebly arcuate toward base, nearly as long as the head and prothorax, with the antennæ inserted at apical two-fifths in the male, slightly longer and thinner in the female, with the antennæ inserted at the middle; antennæ slender, the basal joint of the funicle long, moderately thick, feebly obconical, fully as long as the next three, second a little longer than the third, the latter slightly elongate, outer joints gradually thicker. *Prothorax* one-fourth wider than long, the sides nearly straight and parallel in basal two-thirds, then rounded and rather strongly constricted to the apex, the latter transverse and three-fifths as wide as the base; punctures coarse, deep, not quite contiguous; base lobed in the middle. *Elytra* one-third longer than wide, fully one-third wider than the prothorax, obtusely rounded behind; striae coarse, punctured. *Legs* slender, the posterior femora not toothed. Length 1.4–1.7 mm.; width 0.7–0.9 mm.

Texas (El Paso); Arizona (Benson and Tuçson).

Of this distinct species I have a large series, the principal variation being in the color of the squamules of the pronotum and median series of the elytral intervals.

**13 *T. sibinioides*** n. sp.—Robust, oblong-oval, convex, piceous, the legs, antennæ and beak rufous; vestiture of the upper surface nearly uniform, consisting of long slender ochreous-yellow strigose squamules, without trace of intermingled scales, rather dense, those of the striae punctures similar to the others and equally wide, those along the middle of the intervals semi-erect; under surface more densely clothed with broader whitish scales. *Head* densely squamulose; transverse line not distinct; beak thick but very strongly tapering from base to apex, evenly, rather strongly arcuate, very slender and nude beyond the antennæ, elsewhere strongly punctured, subcarinate and densely squamulose, in the male a little longer than the prothorax, with the antennæ inserted at apical two-fifths, in the female but slightly longer, but with the glabrous apical portion much longer and almost evenly cylindrical, the

antennæ inserted a little behind the middle; antennæ slender, the basal joint of the funicle about as long as the next two, second and third both slightly elongate, club moderate. *Prothorax* small, one-third wider than long, the sides rounded, convergent and scarcely perceptibly constricted anteriorly, becoming parallel in basal half; apex transversely truncate, two-thirds as wide as the base. *Elytra* fully one-third wider than the prothorax, scarcely three times as long, barely one-fourth longer than wide; sides parallel in basal half or slightly more. Posterior femora rather slender, not at all toothed. Length 1.6–1.75 mm.; width 0.8–0.9 mm.

Arizona (Santa Rita Mts.). Mr. H. F. Wickham.

The elytra have a very small sutural notch, but are not individually broadly rounded as they are in Sibiria. This peculiar type is well represented in Brazil. Four specimens.

14 **T. mica** n. sp.—Oblong-oval, rather convex, rufo-piceous throughout; vestiture moderately dense, generally whitish, pale brown on the disk of the pronotum, consisting throughout, on the upper surface, of parallel but rather broad strigose recumbent scales, rather dense on the pronotum, becoming broader and whiter on the flanks but not different in structure and without trace of intermixed setæ or broad rounded scales; on the elytra similar, recumbent and uniform in structure throughout, but somewhat denser toward the suture; on the under surface larger, elongate-oval, denser. *Head* squamose, the transverse line fine; eyes wider than long; beak in the male stout, densely squamulose except at the tip, feebly arcuate, gradually and not very rapidly tapering, scarcely longer than the prothorax, with the antennæ inserted at apical third; antennæ rather short, the first funicular joint very robust, strongly narrowed at base, as long as the next two, second one-half longer than the third, the latter barely longer than wide. *Prothorax* small, nearly one-third wider than long, the sides subparallel and almost straight in basal half, then rounded, convergent and deeply constricted to the apex, the latter broadly arcuate, two-thirds as wide as the base; punctures dense. *Elytra* one-third wider than the prothorax, two and one-half times as long, one-fourth longer than wide, obtuse at apex, becoming parallel in about basal half; striæ somewhat coarse. *Legs* rather slender, the posterior femora not prominent beneath. Length 1.5 mm.; width 0.7 mm.

Arizona.

This species is not closely allied to any other, but is represented by a single rather imperfect male example. It is easily distinguishable by the uniform structure of the parallel strigose scales of the upper surface, and by the absence of erect bristles.

15 **T. setosus** Lec.—Proc. Am. Phil. Soc., XV, p. 218.

Oblong-oval, moderately convex, more or less pale piceo-rufous; vestiture uneven, consisting of small subrecumbent robust setæ,

sparsely scattered throughout the upper surface, intermixed with large rounded non-strigose scales of a whitish tint, especially noticeable on the prothorax except in a large, more or less distinct spot toward base on each side of the median line, and on the elytra in a large rounded or subannular sutural spot before the middle, along the sutural interval and near the humeri and subapical umbones; the alternate stria intervals with a single series of long stiff erect and widely spaced setæ; under surface densely clothed with large whitish scales. Beak rather long and slender, squamose but only just visibly thicker toward base, distinctly longer than the head and prothorax; antennæ inserted just beyond the middle, the first funicular joint not as long as the next three, second and third subequal, both longer than wide. Prothorax small, one-third wider than long, constricted behind the apex. Elytra two-fifths wider than the prothorax and a little less than three times as long, one-third longer than wide. Posterior femora unarmed, rather slender. Length 1.35–1.8 mm.; width 0.65–0.8 mm.

California (Yuma); Arizona (Benson and Tucson). A rather abundant species, easily recognizable by the mixture of large rounded unevenly distributed scales and long stiff erect setæ, bristling on the elytra. Although the ample series before me shows great variation in size, I am unable to detect any sexual differences in the structure of the beak.

16 **T. subfasciatus** n. sp.—Oblong-oval, moderately convex, dark red-brown; tip of beak pale rufous; antennal club black; vestiture complex, uneven in distribution, consisting of short subrecumbent and very robust setæ and larger rounded whiter scales, the latter especially evident on the elytra along the entire sutural interval and in a wide feebly defined vitta from the humeri to the subapical umbones, also in a conspicuous transverse area, wider and subannulate toward the suture, situated scarcely before the middle of the length; the alternate stria intervals with a single series of short, erect, very stout and widely spaced setæ; under surface densely clothed with large rounded concave and whitish scales. *Head* covered with large umbilicate scales, the beak moderately stout, feebly, evenly arcuate, very feebly tapering from the base, a little longer than the head and prothorax, densely squamose except beyond the antennæ, the latter inserted at apical two-fifths, short, the first funicular joint not quite as long as the next three. *Prothorax* two-fifths wider than long, the sides convergent from base to apex and feebly arcuate, the subapical constriction feeble; apex nearly three-fourths as wide as the base. *Elytra* one-third wider than the prothorax and fully three times as long, two-fifths longer than wide, parallel at the sides in more than basal half, obtusely rounded behind; striæ coarse, punc-

tured, the striae setae white, slender, but distinct. Legs rather short but slender, the femora not dentate. Length 1.6–1.7 mm.; width 0.75 mm.

Texas (Big Springs). Mr. H. F. Wickham.

Allied to *setosus*, but easily distinguishable by the somewhat smaller scales of the upper surface, shorter and stouter erect setae, and by the shorter, rather thicker beak and longer elytra. In both of these species the erect bristles are confined to the alternate intervals, except toward apex. Sexual differences are not evident, even in the length or structure of the beak. The third and fourth ventral sutures are almost obliterated by the dense crust of scales, but appear to be sinuate near the sides, although not flexed backward to any noticeable extent. Four specimens.

17 **T. hispidus** n. sp.—Oblong-oval, rather convex, piceous, elytra, except on the suture, more broadly toward base, legs, beak and antennae, rufous; vestiture moderately dense, not very uneven, consisting, on the upper surface, of long slender squamules, subrecumbent, whitish and pale fulvous confusedly intermingled, evenly distributed over the pronotum and entire width of the elytral intervals, and without trace of large rounded scales; all the elytral intervals throughout their length with single series of long erect bristling setae, whitish in color and rather widely spaced; squamules of the striae punctures distinct, white; under surface rather densely clothed with large oval whitish scales. Head finely squamulose, the transverse impression subobsolete; eyes transversely fusiform; beak in the male rather stout, very feebly tapering and slightly arcuate throughout, squamulose except near the apex, about as long as the head and prothorax, with the antennae inserted just behind apical third; in the female very slightly longer, thick, squamulose and subinflated in basal half, very thin, glabrous and cylindrical in apical half, the antennae inserted at the middle; antennae rather short, the basal joint of the funicle subequal to the next three, second one-half longer than the third. Prothorax one-fourth wider than long, the sides very feebly arcuate, slightly constricted behind the apex, the latter two-thirds as wide as the base. Elytra two-fifths wider than the prothorax and very nearly three times as long, about one-half longer than wide, suboval, the sides parallel and just visibly arcuate, gradually convergent and more rounded toward apex, the latter less obtuse than usual. Posterior femora unarmed. Length 1.4–1.8 mm.; width 0.65–0.8 mm.

Arizona (Santa Rita Mts.). Mr. H. F. Wickham.

This inconspicuous species is somewhat allied to *setosus* and *subfasciatus*, but only in possessing erect bristling setae, otherwise it differs greatly in the entire absence of large rounded scales on the upper surface, and in the strongly marked sexual characters of the beak, the latter, somewhat unusually, being more rapidly and



strongly inflated toward base in the female than in the male, nearly as in *Centrinus hospes*, which inhabits the same region. My series consists of seven specimens.

### THYSANOCNEMIS Lec.

In this genus the sexual divergencies in the structure of the beak are extremely pronounced and far more noticeable than in *Tylopterus*, with which it is closely allied; the present forms may be distinguished from *Tylopterus*, however, by the much coarser, less dense and non-sericeous vestiture. The fringe of hairs of the front tibiæ in the male is not a character of generic importance, and often disappears completely. The five species in my cabinet may be mutually distinguished by the following table:—

Elytral intervals subequal in width and prominence.

Body pale rufo-testaceous, the elytra with a broad, darker and generally less densely squamulose band, narrowed toward the suture, often indistinct; sometimes also with a short angulate sutural band of paler scales near apical third.....**fraxini** Lec.

Body piceous-black, the beak and legs rufous, the tibiæ with a narrow submedian band blackish, the femora dark except toward base; vestiture strongly mottled with black and whitish, fulvous near the base of the elytra especially near the humeri, and on the pronotum except toward the sides and in the middle toward base; on the elytra a whitish band at basal fourth and a narrower angulate band at apical third are especially noticeable. Head squamose; eyes separated by barely one-half of their own width; beak in the male short but rather thin, feebly arcuate, as long as the prothorax, with the antennæ inserted at apical third; in the female very thin, smooth, cylindrical, evenly, distinctly arcuate, as long as the head and prothorax, with the antennæ inserted at about the middle; antennæ long, the funicle slender, with the basal joint more than one-half as long as the remainder, club robust, blackish, not as long as the preceding six joints. Prothorax one-half wider than long, narrowed in apical third, the sides thence parallel and almost straight to the base. Elytra nearly one-half wider than the prothorax, three times as long, parallel, broadly rounded at apex, with the subapical umbones rather distinct. Length 3.0–3.3 mm.; width 1.3–1.6 mm. Arizona (Winslow). Mr. H. F. Wickham.....**graphica** n. sp.

Body uniformly pale ochreous-testaceous throughout.

Vestiture dense, pale yellowish, consisting of elongate subrecumbent scales, intermixed with narrower hairs on the pronotum, each elytral interval with a single series of very broad semi-erect distant scales. Head convex; eyes separated by rather more than one-half of their own width; beak in the male rather thick, cylindrical, feebly arcuate, finely, sublinearly punctate, barely as long as the head and prothorax;

antennæ inserted rather beyond apical third, the first funicular joint scarcely as long as the next three, club not as long as the preceding six joints combined. Prothorax nearly four-fifths wider than long, rounded and narrowed in apical half, the apex transversely truncate and about three-fifths as wide as the base. *Elytra* at base two-fifths wider than the prothorax, more than three times as long, broadly, feebly sinuate at base, the sides straight and parallel in basal three-fifths. Length 2.8 mm.; width 1.4 mm. Arizona.....**squamiger** n. sp.

Vestiture dense, consisting, on the pronotum, of long slender pointed subrecumbent squamules, on the elytra of similar squamules and with a single series of long robust lanceolate and suberect scales on each interval; the latter scales very coarsely and deeply strigose, ochreous and piceous-black in color. Head densely hispid-squamose between the eyes, the latter separated by much less than one-half of their own width; beak in the male very short, thick, feebly bent, equal in length to the prothorax; antennæ inserted at apical third, the basal joint of the funicle but slightly longer than the next two, club very long, fusiform, deeply annulated, longer than the preceding six joints combined. Prothorax scarcely more than one-half wider than long, the sides strongly convergent and nearly straight in apical half, the apex one-half as wide as the base; punctures rather coarse, very dense; vestiture uniform. Elytra nearly one-half wider than the prothorax, more than three times as long, the sides parallel and nearly straight in basal three-fifths. Length 3.5 mm.; width 1.75 mm. Southern California.

**horridula** n. sp.

Elytral intervals distinctly alternating in width, the wider rather more convex and more densely clothed; body uniformly pale ochreous-testaceous throughout.....**helvola** Lec.

In *graphica*, which is a very isolated species, intermediate in habitus between *Thysanocnemis* and *Tylopterus*, the pronotal vestiture is fulvous except narrowly along the median line and at the sides toward base, where it becomes white, the white lateral area curved inward just behind the middle of the disk, giving the appearance of a transverse interrupted band.

OTIDOCEPHALINI.

**OTIDOCEPHALUS** Chev.

Since the last revision of this genus by Dr. Horn (Proc. Am. Phil. Soc., XIII, p. 448), several remarkable forms have been discovered in Florida and our extreme southwestern territories. In the memoir referred to, seven species were recorded as occurring within the United States, and one other was subsequently added by LeConte. Besides *O. perforatus*, for which a separate genus

is proposed below, fifteen species are now brought to notice; probably many more still remain unknown. Mexico appears to be the principal focal centre of *Otidocephalus*, and, although well represented in Brazil, the genus would seem to be relatively less abundant there, being largely replaced by *Erodiscus*.

The species are readily subdivided into well-marked groups based upon femoral, rostral and ungual structure, size of the eyes and nature of the vestiture as follows:—

- Beak without dorsal excavation; femora dentate .....2  
 Beak with a large and very deep excavation near the middle; femora unarmed.....9  
**2**—Tarsal claws with a large, acutely angulate, internal lobe; body with erect setæ.....3  
 Tarsal claws broadly swollen within toward base, but not at all angulate; body entirely without erect setæ .....8  
**3**—Elytra with more or less dense recumbent vestiture in addition to the erect setæ, the pubescence tufted in structure.....4  
 Elytra with sparser recumbent or subrecumbent and paler hairs, simple in structure and always confusedly distributed over the surface.....5  
 Elytra with stiff erect white setæ, intermingled with longer, more slender, blackish hairs, all forming single series on the intervals .....6  
 Elytra with simple erect setæ, either black or whitish in color, forming single series on the intervals .....7  
**4**—Elytra each with four glabrous or subglabrous vittæ.  
     Vittæ narrow and sharply defined, with a few scattered tufts only near the apex.....1 **vittatus**  
     Vittæ much wider, always with unevenly scattered pubescent tufts throughout the length, punctured and indefinitely limited; body smaller and relatively stouter.....2 **nivosus**  
 Elytra without four subglabrous vittæ.  
     Pubescence moderately dense, paler along the elytral suture and median line of the pronotum .....3 **ulkei**  
     Pubescence uniform in color throughout the upper surface, pale brownish-cinereous, broadly dense on the elytral intervals, but denuded in a narrow space on each side of the series of punctures, producing a multi-vittate appearance; dorsal setæ very short.....4 **insignis**  
**5**—Elytra without well-defined series of punctures, confusedly and unevenly punctate throughout .....5 **estriatus**  
 Elytra with impressed even series of coarse deep punctures.  
     Body very robust, the subrecumbent setæ coarse, abundant, pure white and very conspicuous; pronotum sparsely, unevenly and not coarsely punctate .....6 **egregius**  
     Body narrow, the subrecumbent shorter hairs sparse, somewhat dark in color and not very conspicuous; pronotum coarsely and very densely punctate .....7 **scrobicollis**

- 6—Elytral series feebly impressed, coarsely, deeply and rather remotely punctured.....8 **floridanus**
- 7—Eyes separated by much less than one-half of their own width.  
 Elytral punctures fine, the series not impressed on the disk, the setæ confined in great measure to the alternate intervals, except toward apex; body rather stout .....9 **lævicollis**
- Elytral punctures coarser, the series just visibly impressed, the setæ more abundant and conspicuous, widely spaced along all of the intervals; body smaller and narrower .....10 **speculator**
- Eyes widely separated.  
 Elytra strongly inflated behind, the setæ very sparse, rather short, whitish in color and only distinct toward apex.....11 **myrmecodes**
- Elytra but slightly wider behind the middle than at base; setæ numerous, long, blackish in color; stria punctures coarser.  
 Body stouter, the antennæ rufous .....12 **ruficornis**
- Body slender, the antennæ black .....13 **myrmex**
- 8—Ferruginous, the elytra blackish in apical half or more; body with short, white, slender, sparsely scattered and recumbent squamules; femoral teeth very minute .....14 **dichrous**
- 9—Polished, black, the legs, beak and antennæ piceous; pronotum and elytra glabrous, without erect setæ, except a few borne from a series of punctures along the apical margin of the former on the flanks, and, on the latter, several toward apex, and one much longer and isolated on each side of the scutellum.....15 **cavirostris**

The division of the genus by the form of the prothorax is impracticable, as, in several species, this part is more or less cylindrical in the male and obovate in the female, notably so in *speculator*.

1 **O. vittatus** Horn.—Proc. Am. Phil. Soc., XIII, 1873, p. 448.

Elongate-oval, strongly convex, black, polished, densely clothed with white pubescence formed of recumbent tufted hairs; each elytron with four narrow, feebly convex, abruptly defined, glabrous vittæ and a much narrower uneven line very near the suture, the glabrous vittæ narrow, but slightly more than one-half as wide as the pubescent stripes, and each with a series of small widely and unevenly spaced punctures bearing short piceous setæ. Beak short, thick, three-fifths to three-fourths as long as the prothorax, deeply, unevenly punctate at the sides, the antennæ inserted at apical two-fifths in the female and but just visibly beyond in the male. Prothorax coarsely, unevenly punctate, with a polished fusiform tumid and almost entire median impunctate line. Elytra but slightly wider behind the middle than at base, almost twice as long as wide.



Legs rather stout, pubescent, the femora somewhat strongly toothed. Length 7.0–8.3 mm.; width 2.5–3.0 mm.

Southern California. My series of five specimens indicates but slight variability, and the species, which is one of the largest of the genus, may be readily known by the narrow, abruptly glabrous, polished vittæ of the elytra.

2 **O. nivosus** n. sp.—Oval, feebly subcuneate, black, polished, densely clothed with white recumbent pubescence formed of tufted hairs, intermingled with short stiff sparse piceous setæ, the elytra each with five subglabrous vittæ, the first adjoining the suture; those of the disk fully two-thirds as wide as the pubescent stripes, all more or less confusedly punctate toward their lateral limits, and always unevenly and sparsely covered with tufted pubescence. *Head* sparsely pubescent, densely so between the eyes which are separated by but slightly less than their own width; beak short, thick, straight, coarsely, rugosely punctate, rather densely pubescent in tufts throughout, three-fifths to three-fourths as long as the prothorax, the antennæ inserted at apical third in the male, the second joint of the funicle almost as long as the first. *Prothorax* but slightly longer than wide, strongly inflated at about the middle, the base and apex subequal in the male, but the former relatively narrower in the female, coarsely, closely and unevenly punctate, with a subentire tumid impunctate line. Scutellum densely tomentose. *Elytra* at base one-half to two-thirds wider than the base of the prothorax, slightly wider behind the middle than at base, three-fourths longer than wide. *Legs* moderate; femoral teeth small, acute; anterior tibiæ obtusely strongly swollen or subdentate within at the middle. Length 6.0–6.5 mm.; width 2.4–2.6 mm.

Arizona (Peach Springs); Texas (El Paso).

This species is closely allied to *vittatus*, but differs constantly in a number of structural features. The prothorax and elytra are both less elongate, and the subglabrous stripes of the latter are wider, indistinctly limited and always more or less pubescent; the antennæ are rather more apical in insertion, the femoral teeth smaller, and the anterior tibiæ more strongly and angularly swollen within at the middle. The size is noticeably smaller than in *vittatus*. Three specimens.

3 **O. ulkei** Horn.—Proc. Am. Phil. Soc., XIII, p. 449.

This species is described as being moderately densely clothed with pubescence, which is recumbent and composed of tufted hairs as in *vittatus* and *insignis*, the vestiture paler along the middle of the pronotum and elytra. The femora are minutely toothed. Length (exclusive of the head) 6.5 mm.

Lower California. A single specimen in the cabinet of Mr. Henry Ulke of Washington.

4 **O. insignis** n. sp.—Rather robust, subcuneate, very strongly convex, polished, black throughout, densely clothed with tufts of pale brownish-cinereous pubescence, rather denser and whiter beneath, especially on the sternal parapleuræ, semi-erect on the pronotum, where they are mixed with sparse, anteriorly directed and erect black setæ, becoming white on the flanks and toward base, recumbent on the elytra and mingled with posteriorly-inclined, short sparse and whitish setæ, mixed with blackish near the apex, the elytral intervals becoming abruptly glabrous near the series of punctures, producing a narrowly multi-vittate appearance, the median line of the pronotum and the elytral suture not at all paler. *Head* densely clothed with recumbent whitish tufts between the eyes, concealing the sculpture, more sparsely so behind; eyes separated by fully their own width, feebly convex; beak thick, one-half as long as the prothorax, straight, not carinate above, coarsely punctured and longitudinally, indefinitely sulcate and rugose toward the sides, sparsely punctate on the disk toward apex, sparsely clothed with erect hispid setæ; antennæ inserted at apical two-fifths, the funicle densely hispido-setose, the second joint nearly twice as long as wide, three-fourths as long as the first and one-half longer than the third, club rather large, oval, extremely densely clothed with short brownish pubescence. *Prothorax* one-fourth longer than wide, the base a little wider than the apex, the sides strongly rounded and inflated at basal third, thence sinuate to the base; disk coarsely, deeply, unevenly punctate, the punctures denser above, sparser on the flanks, with a smooth impunctate median line in apical half. *Scutellum* rather large, triangular, extremely densely clothed with white pubescence forming a tumid mass. *Elytra* at base two-thirds wider than the base of the prothorax, but only one-fourth wider than the disk, nearly two and one-half times as long, not quite twice as long as wide, perceptibly wider behind the middle than at base; disk with unimpressed series of fine, unevenly and moderately spaced punctures, the series but just visibly impressed near the lateral margin. *Legs* long; femora strongly toothed; tibiæ arcuate toward base. Length 8.5 mm.; width 3.3 mm.

Texas (El Paso). Mr. G. W. Dunn.

The largest species which I have seen, and allied to *ulkei* in the development of the remarkable tufts of setæ, densely covering the integuments; each of these tufts is composed of three or four long slender hairs, which are united and attached at base by a short stout common foot-stalk. It differs from *ulkei* in the sculpture of the beak, in the denser vittæ of the elytra, uniform in color and not paler at the suture, and in its larger size.

5 **O. estriatus** n. sp.—Robust, extremely convex, shining, black, the beak antennæ and entire elytra more or less rufo-piceous but dark; pubescence simple, very sparse, recumbent, whitish, intermingled on the pronotum and elytra, especially toward apex, with extremely few remote blackish setæ; under surface rather sparsely clothed with long flexible whitish hairs, very dense on

the sternal parapleuræ. *Head* coarsely, deeply, very densely punctate, flat and longitudinally rugose between the eyes, sparsely clothed with short whitish hairs; eyes large, rather convex, separated by four-fifths of their own width; beak thick, scarcely arcuate, not quite as long as the prothorax, gradually, distinctly dilated toward apex, with two approximate eroded and unevenly punctate grooves in basal half, separated by a smooth impunctate line, laterally very coarsely, deeply, densely punctate and rugose but not sulcate, above toward apex strongly punctate and with two widely distant longitudinal impressions; antennæ inserted at apical third, the second funicular joint obconical, three-fourths as long as the first, club elongate-oval, densely pubescent, darker in color. *Prothorax* very slightly longer than wide, the apex broadly arcuate, a little wider than the base; sides subparallel and nearly straight in apical two-thirds, then gradually rounded, convergent and sinuate to the base; disk coarsely, deeply, unevenly and closely punctate, the punctures becoming finer near the apex, sparse on the flanks toward base and with a narrow subentire tumid impunctate line along the middle. *Scutellum* small, densely covered with yellowish-white tomentum. *Elytra* at base two-thirds wider than the base of the prothorax, two and one-half times as long, three-fourths longer than wide, only slightly wider behind the middle than at base; humeri obtusely angulate, scarcely rounded, subprominent; disk without series but with moderately fine, deeply impressed punctures unevenly distributed in longitudinal vittæ, separated by subimpunctate narrower lines, which have exceedingly remote larger punctures bearing the stiff erect setæ. *Legs* moderate in length, sparsely pubescent, the femora distinctly, acutely toothed beneath. Length 5.5 mm.; width 2.2 mm.

New Mexico (Las Vegas). Mr. Meeske.

The uneven sculpture and sparse recumbent vestiture distinguish this species from any other within our fauna; it may perhaps be allied to the Mexican *flavipennis* Chev.

6 ***O. egregius*** n. sp.—Oblong-ovoidal, strongly convex, rather robust, black and polished throughout, the upper surface clothed sparsely but conspicuously with short robust recurved white setæ, unevenly scattered on all the interval of the elytra and mingled with longer finer erect and more widely dispersed piceous setæ; legs and under surface rather sparsely but distinctly clothed with short and more recumbent white hairs, dense and tufted on the sternal side-pieces and mesosternum between the coxæ, also with sparser tufted hairs on the prosternum and toward the anterior margin of the metasternum. *Head* coarsely but not very densely or deeply punctate; eyes large although not very prominent, separated by one-third of their own width; beak thick, just noticeably wider at apex, feebly bent, three-fourths as long as the prothorax in the male, smooth and impunctate broadly along the middle, with a feeble impressed line between the antennæ, coarsely, closely punctate and longitudinally sulcate laterally, hispid with erect setæ; antennæ inserted at apical third, long, slender, the first funicular joint a little longer than the next two, club rather small, elongate, pointed, asymmetrically fusiform. *Prothorax*

distinctly longer than wide, the base and apex subequal in the male, the former relatively narrower in the female; sides feebly arcuate, convergent and straight toward base; punctures rather small, feeble, remote and unevenly distributed. Scutellum densely pubescent. *Elytra* oblong, at base almost twice as wide as the prothorax, nearly two and one-half times longer, three-fifths longer than wide, not distinctly wider behind the middle than at base, the sides subparallel; striae broadly, rather strongly impressed, coarsely, deeply and not very closely punctate; intervals convex, minutely, sparsely and unevenly punctate. *Legs* rather short and stout, the femora strongly toothed; tibiae bent toward base. Length 5.0 mm.; width 1.9 mm.

#### Arizona.

The two specimens before me represent one of the most distinct species of the genus, recognizable at once by the numerous coarse recurved white setae of the upper surface, the subparallel elytra, relatively narrow prothorax, large eyes and large femoral teeth. It does not appear to be at all closely allied to any of the Mexican species.

7 *O. scrobicollis* Boh—Sch. Gen. Curc., VII, ii, p. 205; Horn: Proc. Am. Phil. Soc., XIII, p. 450.

Black, polished, narrowly, feebly subcuneate, bristling with long coarse erect and blackish setae, with a few short paler subrecumbent hairs interspersed. Head and beak coarsely closely and unevenly punctate; eyes separated by three-fourths of their own width; beak rather slender, not quite as long as the prothorax, confusedly, longitudinally sulcate and rugose, with an elongate feeble impression in the middle between the antennae, the latter long, the second funicular joint barely one-half as long as the first; basal joint of the club long and evenly obconical, with the sides straight. Prothorax but slightly longer than wide, the sides sinuate behind the apex and more broadly before the base, the apex broadly arcuate and scarcely wider than the base; disk very coarsely, densely punctate. Scutellum small, pubescent. *Elytra* at base three-fifths wider than the base of the prothorax, two and one-half times longer, not quite twice as long as wide, slightly wider behind the middle than at base, the humeri narrowly rounded; disk with feebly impressed series of coarse, rather close-set punctures. *Legs* slender, the femora very long, the tooth small. Length 4.2 mm.; width 1.6 mm.

Pennsylvania to Texas. A well-marked species which cannot fail of recognition by reason of the sparse dual vestiture, coarse sculpture and long slender feebly toothed femora. It does not appear to be abundant.



8 **O. floridanus** n. sp.—Slender, feebly cylindro-cuneate, polished, black throughout, the upper surface bristling with long sparse erect setæ, white and piceous indiscriminately intermingled, the piceous setæ longer and much thinner than the white, the latter rather robust; under surface very remotely, feebly albido-pilose, the scutellum, sternal parapleuræ and mesosternum between the narrowly separated coxæ densely clothed with recumbent white tufted pubescence. *Head* sparsely, unevenly, distinctly punctate, without frontal fovea, the eyes separated by scarcely more than two-thirds of their own width; beak moderately thick, very short, nearly straight, scarcely two-thirds as long as the prothorax, narrowly polished and tumid along the middle between two punctured erosions, coarsely, closely punctatorugose at the sides, sparsely hispidio-setose; antennæ moderate. *Prothorax* almost evenly truncato-fusiform, much longer than wide, the base and apex about equal in width, the latter only very feebly arcuate; sides evenly, feebly arcuate, scarcely at all sinuate near the base; disk rather finely, sparsely, unevenly punctate, widest at the middle. *Elytra* distinctly more than twice as long as the prothorax, and, behind the middle, twice as wide as the disk of the latter, gradually slightly narrower thence to the base; humeri rather broadly exposed but obliquely truncate; disk with very feebly impressed series of rather coarse, deep, somewhat distant punctures, the punctures of the interstitial series minute and very remote. *Legs* rather short and thick, the femoral teeth large and prominent; tibiæ bent toward base. Length 4.0 mm.; width 1.3 mm.

Florida.

A slender species, somewhat resembling *myrmex* in form, but abundantly distinct in the mixture of long white and blackish setæ of the upper surface, the longer elytra, and in the subcylindrical and not obovate prothorax.

9 **O. lævicollis** Horn.—Proc. Am. Phil. Soc., XIII, p. 451.

Rather robust, feebly cuneate, strongly convex, polished, black throughout, the tarsi piceous; upper surface very sparsely covered with moderately long erect setæ, white in color but becoming blackish on the disk of the pronotum anteriorly, and shorter and denser near the base, very remote in single series on the elytra, where they are confined for the most part to the alternate intervals; under surface and legs covered with sparse semi-erect white setæ, the scutellum and sternal parapleuræ densely pubescent. *Head* almost completely impunctate, narrow, slightly depressed, opaque, sparsely punctate and sparsely setose between the eyes, the latter large, prominent and separated by less than one-third of their own width; beak moderate, coarsely punctate and rugose at the sides, with a feebly impressed longitudinal line in the middle between the

antennæ. Prothorax extremely minutely and remotely punctate, strongly narrowed toward base, the latter scarcely three-fourths as wide as the apex in the female; disk but slightly longer than wide. Elytra scarcely more than one-half longer than wide, twice as long as the prothorax, and, behind the middle, twice as wide; striæ unimpressed, except feebly near the sides, composed of fine, not very close-set punctures. Legs rather long; femoral teeth only moderately developed, acute; tibiæ feebly bent toward base. Length 3.3–4.3 mm.; width 1.3–1.8 mm.

New York to Texas. Easily distinguishable by the large prominent approximate eyes, and fine punctures of the unimpressed elytral series. The specimen described is a female.

10 ***O. speculator*** n. sp.—Subcuneate, strongly convex, black and highly polished throughout, the upper surface bristling with very sparse long erect setæ, white in color but blackish on the disk of the pronotum toward apex, and forming an even single series on each of the elytral intervals, very sparse, shorter, finer and less erect on the under surface, the scutellum and sternal parapleuræ densely albedo-pubescent. *Head* smooth, scarcely at all punctate, the interocular surface setose, not depressed, slightly dull and remotely punctate; eyes large, prominent, separated by scarcely more than one-third of their own width; beak in the male short, thick, straight, two-thirds as long as the prothorax, smooth and impunctate above, coarsely punctato-rugose at the sides, and above, in apical two-fifths, having two wide, depressed, dull and reticulate, parallel and rather approximate areas, the narrow interval being impressed along the middle; in the female smoother above at apex; antennæ moderate, the first funicular joint robust, as long as the next two, second a little longer than the third, both elongate, the club elongate, pointed, asymmetrically fusiform. *Prothorax* distinctly longer than wide, with the apex broadly arcuate; base nearly as wide as the apex in the male but scarcely three-fourths as wide in the female; disk almost impunctate, but with a few rather coarse punctures at the sides near the apex. *Elytra* one-half longer than wide, twice as long as the prothorax, and, behind the middle, distinctly more than twice as wide as the latter in both sexes; humeri very broadly exposed, obtusely rounded; disk with very feebly impressed series of rather coarse distant punctures, the sutural series more strongly impressed as usual. *Legs* moderate, the femoral teeth rather small, acute. Length 3.5–3.7 mm.; width 1.4–1.5 mm.

Texas.

This species, which is represented in my cabinet by three specimens, is closely allied to *lævicollis*, but differs in its smaller size, less robust form, more abundant and conspicuous white setæ of the elytra distributed along all of the intervals, and in the coarser

punctures of the elytral series. The sparse setæ of the pronotum seem to be inclined to serial arrangement in basal half.

11 **O. myrmecodes** Chev.—Ann. Ent. Soc. Fr., 1832, p. 445; *chevrolati* Horn: Proc. Am. Phil. Soc., XIII, p. 450.

Cuneate, strongly convex, polished, black throughout, almost glabrous above, the head and basal parts of the beak with short sparse erect white setæ, also a few of the latter longer and widely spaced along the intervals of the elytra becoming white toward apex; prothorax feebly piceo-setose; under surface and legs very sparsely clothed with short white hairs, the scutellum and sternal parapleuræ as usual densely albido-pubescent. Head finely, remotely punctate, with a large deep elongate fovea between the eyes, the latter separated by a little less than their own width; beak short, polished, strongly punctured on the sides; antennæ black. Prothorax almost one-third longer than wide, strongly convex longitudinally in apical two-thirds, gradually feebly inflated anteriorly, strongly, rather unevenly punctate, especially in apical half and near the base. Elytra less than twice as long as wide, convex longitudinally, strongly inflated behind, where they are more than twice as wide as the disk of the prothorax; striæ unimpressed except near the sides and composed of fine but deep, rather close-set punctures. Legs long, the femora slender, rather minutely toothed; tibiæ almost straight. Length 3.7–5.0 mm.; width 1.4–2.0 mm.

Rhode Island, District of Columbia, North Carolina and Indiana; numerous specimens. This is a distinct species, easily known by its strongly, posteriorly inflated elytra, feebly developed dorsal setæ, slender, straight, finely toothed femora and deep frontal fovea. I do not know the law or precedent under which the name given by Chevrolat was changed by Dr. Horn; If *myrmecodes* Say is a synonym of *myrmex* Hbst., as seems to be undoubtedly the case, Chevrolat's name cannot be preoccupied.

12 **O. ruficornis** n. sp.—Rather stout, convex, very feebly subcuneate, black throughout and highly polished; antennæ and tarsi brownish-rufous; upper surface with numerous but very sparse, long, erect, blackish setæ, becoming whiter near the elytral apex laterally and also on the under surface, where they are much shorter and subrecumbent; scutellum and sternal parapleuræ densely albido-pubescent. Head and beak rather sparsely but evidently and unevenly punctate; eyes separated by slightly less than their own width, the interocular surface broadly, feebly impressed between two feeble and distant carinæ; beak short, rather thick, nearly straight, not dilated

toward apex, subglabrous, three-fourths as long as the prothorax, with two parallel uneven grooves on the disk, rather distant and obsolete at the middle, and, on each side at the declivity, a longitudinal groove, entire, but becoming feebler toward the apex, also coarsely punctate at the sides toward base, the punctures of the upper surface near the apex almost obsolete; antennæ moderate, the first funicular joint rather slender, obconical, second slightly longer than the third, club rather small, evenly elliptical, less than one-half longer than wide. *Prothorax* strongly convex, one-fourth longer than wide, the apex broadly arcuate, much wider than the base; sides feebly divergent from the apex to the middle, then more strongly convergent and nearly straight to the base; disk finely, remotely and unevenly punctate, the punctures impressed and distinct. *Elytra* at base two-thirds wider than the base of the prothorax, slightly but distinctly wider behind the middle, three-fourths longer than wide, the series scarcely at all impressed and composed of rather small, moderately close-set punctures. *Legs* rather stout, the femoral teeth large; tibiae only just visibly bent toward base. Length 4.7–5.0 mm.; width 1.7–1.8 mm.

#### Arizona.

Allied closely to *myrmex*, but larger and stouter, with the elytral series finer and less impressed. I should have referred the two specimens in my cabinet to *mexicanus* Chev., as they agree tolerably well with the description of Rosenskoeld, but the elytra are evidently much shorter, their length being given as almost three times that of the prothorax in that species, while in *ruficornis* they are only just twice as long.

13 **O. myrmex** Hbst.—Käfer, VII, p. 56; Horn: Proc. Am. Phil. Soc., XIII, p. 450; *myrmecodes* Say: Curc. p. 15; Ed. Lec., I, p. 278; *americanus* Chev.: Ann. Ent. Soc. Fr., I, 1832, p. 105; Gyll. et Rosen.: Sch. Curc. III, p. 366; VII, p. 205.

Narrowly and very feebly subcuneate, very strongly convex, polished, black throughout, the upper surface with numerous long erect blackish hairs, on the elytra disposed in a single widely-spaced series on each interval, on the under surface and legs generally whiter, the sternal side-pieces densely clothed with white pubescence, recumbent, and tufted in structures as usual. Beak short; antennæ slender, the funicular joints two to four subequal, each slightly elongate; eyes moderate, separated by a little less than their own width. *Prothorax* strongly convex before the middle, sparsely, rather strongly and unevenly punctate, one-fifth longer than wide, the apex broadly arcuate and but slightly wider than the base. Scutellum densely pubescent. *Elytra* very nearly twice as long as wide, rather distinctly wider behind; punctures coarse, the series



feebly impressed. Legs rather slender; femoral teeth large; tibiae bent toward base. Length 3.6–4.4 mm.; width 1.2–1.6 mm.

This is a common species, easily recognizable by its narrow form, the long blackish and somewhat abundant setæ of the upper surface, and the strong stria punctures. My specimens are from New Jersey, Pennsylvania and Indiana.

14 **O. dichrous** Lec.—Proc. Am. Phil. Soc., XV, p. 191.

Rather narrowly and feebly cupeate, less convex above than usual, polished and ferruginous throughout, the elytra piceous black in apical half to two-thirds; erect setæ completely wanting, the body throughout with extremely sparse recumbent squamules, very slender in form and white in color; scutellum densely tomentose; sternal side-pieces not densely pubescent, the met-episternum with a narrow uneven line of squamules. Head finely, sparsely but distinctly punctate, with a deep elongate-oval interocular fovea; eyes moderately large, strongly convex, coarsely faceted, separated by fully one-half of their own width; beak very short, thick, cylindrical, feebly sculptured even toward the sides; antennæ nearly normal, but with the club very indistinctly annulated, the scrobes passing beneath at a great distance from the eyes. Prothorax distinctly elongate, subcylindrical, feebly and gradually inflated to slightly behind the middle, sparsely, distinctly but unevenly punctate. Elytra behind the middle twice as wide as the prothorax and much wider than at base, almost twice as long as wide; humeri broadly exposed; striae feebly impressed, composed of coarse, deep, close-set punctures. Legs long, with short sparse recumbent squamules, not setose; femoral teeth very minute, the posterior femora long and sublinear; third tarsal joint very widely bilobed; claws divaricate, thick, strongly arcuate, gradually swollen internally toward base but not in the least angulate. Length 4.1–4.7 mm.; width 1.4–1.75 mm.

Georgia and Florida. The large series in my cabinet seems to indicate but little variability, except in the extent of the blackish area of the elytra. This remarkable species is aberrant in its vestiture and in the structure of the tarsal claws.

15 **O. cavirostris** n. sp.—Narrowly subcuneate, highly polished, strongly convex, black, the legs, beak and antennæ piceo-rufous; body almost completely glabrous, a few erect setæ near the anterior margin of the prothorax, a long seta near the scutellum and a few toward the elytral apex being all that are visible

in the type; scutellum, mesosternal side-pieces and met-episterna posteriorly, densely clothed with recumbent white pubescence. *Head* sparsely but distinctly punctate toward base and between the eyes, elsewhere entirely impunctate; eyes rather large, moderately prominent, separated by a little less than their own width; beak very short and robust, barely more than one-half as long as the prothorax, parallel, rather wider than thick, with a large and extremely deep excavation just behind the middle, occupying the entire width, rounded and bounded by an acute densely ciliate edge on the sides and behind, the anterior edge obtuse and transverse; bottom of the cavity ascending anteriorly and feebly bicarinate; rostral surface between the cavity and apex and also at the sides throughout, strongly though not very densely punctate; antennæ short, the basal joint of the funicle robust, second slightly elongate, third not quite as long as wide, outer joints thicker, club nearly as long as the preceding six joints, strongly annulated. *Prothorax* distinctly longer than wide, widest at two-fifths from the base, the sides thence almost straight and very feebly convergent to the broadly arcuate apex, and strongly convergent and constricted to the base, the latter barely three-fifths as wide as the apex; disk finely but strongly, almost evenly and somewhat closely punctate. Scutellum distinct. *Elytra* scarcely more than one-half longer than the prothorax, and, at base nearly twice as wide as the base of the latter but not wider than the disk, gradually rather strongly inflated posteriorly, and, behind the middle, two-fifths wider than the disk of the prothorax, three-fourths longer than wide, very strongly, evenly convex longitudinally; humeri rather prominent, narrowly rounded, the exposed basal portion oblique; striæ feebly impressed except toward apex, the punctures small, moderately close-set and distinct. *Legs* rather long, very slender, the femora linear, scarcely at all sinuate toward apex and completely unarmed; tarsal claws normal. Length 1.9 mm.; width 0.6 mm.

#### Florida.

The single specimen of this extremely interesting species was taken in the southern part of the State by Mr. F. Kinzel, and very kindly presented to me by Mr. Wilhelm Jülich. It is related to the Cuban *poeyi* Chev. in the extraordinary rostral excavation and unarmed femora, but differs in coloration and, probably also, in its smaller size and more sparsely punctate head. It is by far the most minute of our species, and, together with *poeyi*, might well be separated as a distinct genus.

#### OOPTERINUS n. gen.

This genus is founded upon a remarkable species described by Dr. Horn under the name *Otidocephalus perforatus*. It differs from *Otidocephalus* in having the elytra ovate, rounded on the sides, widest a little before the middle, gradually attenuate and

acutely rounded behind, and with the humeri entirely obsolete, in the complete absence of scutellum, and in its small eyes. The elytra are probably subconnate. In its short deeply sinuate prosternum, short beak, and toothed claws, *Oopterinus* resembles *Otidocephalus*.

**O. perforatus** Horn.—Proc. Am. Phil. Soc., XIII, p. 451.

Oval, piceous, the elytra and legs still paler, the upper surface with a few rather short, semi-erect, widely scattered whitish setæ. Head sparsely but strongly punctate, the interocular surface impunctate but with a small rounded median fovæ; eyes remarkably small, coarsely granulated, separated by fully their own width; beak rather thick, feebly arcuate, almost as long as the prothorax, strongly punctured at the sides and with a short longitudinally impressed line between the antennæ, the latter slender, the second funicular joint obconical, one-half longer than the third; club oval, rather sparsely pubescent. Prothorax longer than wide, strongly narrowed and feebly constricted toward base, very coarsely, deeply, slightly unevenly but rather closely punctate. Elytra ovate, two-thirds longer than wide, widest before the middle, the sides evenly rounded; humeri obsolete; punctures very fine, disposed in even series which are entirely unimpressed except near the base. Legs very slender, the femora broadly emarginate near the apex but not toothed. Length 3.3 mm.; width 1.3 mm.

The single specimen in the LeConte cabinet has no indication of locality, but the original type, in the cabinet of Mr. Ulke, is from Maryland.

#### CRYPTORHYNCHINI.

#### CONOTRACHELUS Schönh.

The following rather isolated species may be referred at present to the groups outlined by Dr. LeConte.

**C. compositus** n. sp.—Oblong-oval, moderately convex, not at all shining, black, the legs and antennæ rufo-piceous; elytra clothed densely with short recumbent hairs, piceous in color, fulvous along the ridges and yellowish in three elongate spots at the base of each, the two outer coalescent, the pronotum more sparsely pubescent, with a few whitish hairs scattered in an oblique line at each side; upper surface throughout bristling with short stiff erect setæ. Head and beak densely hispid with short bristles and more recumbent hairs; front foveate; beak separated from the head by a deep

transverse impression, very short and thick, distinctly and evenly arcuate, four-fifths as long as the prothorax, very deeply coarsely and densely punctato-subsulcate and dull; antennæ inserted at apical third, the second funicular joint scarcely as long as the first but rather longer than the next two. *Prothorax* not quite as long as wide, the sides in basal three-fourths parallel, straight but convergent near the base, rather prominent at apical fourth, thence convergent and constricted to the apex; disk evenly convex but exceedingly coarsely, roughly punctato-foveate, the foveæ closely crowded and irregular, with a fine strong carina in apical half, rendered more prominent by a depression in the surface at each side of it. *Elytra* at base three-fifths wider than the prothorax, two and three-fourths times as long, one-third longer than wide, the sides parallel toward base, sinuate near the apex; humeri broadly exposed, prominent and obtusely carinate; disk with unimpressed series of large deep rather close-set punctures; intervals flat, the third obtusely tumid at the base, before the middle and through apical third, the fifth more especially from basal third to the subapical impression, the seventh at the humeri and to a greater or less degree along its entire extent. *Abdomen* with not very dense large and small punctures. *Femora* with two acute spiniform teeth; tarsal claws divergent, strongly toothed. Length 5.4 mm.; width 2.5 mm.

#### Arizona.

May be associated with *affinis* for the present, but widely distinct from any other described species known to me.

**C. carinifer** n. sp.—Oblong-oval, feebly convex above, not shining, piceous-black, the elytra, legs and antennæ more or less rufescent; elytra clothed densely with short recumbent hairs, fulvous, mottled unevenly with whitish, the latter more evident in a transversely lunate area at apical third, also with a few widely scattered extremely short recurved and semi-erect setæ; pronotum glabrous although sparsely setose. *Head* finely, closely punctate, fulvido-pubescent, the beak long, slender, arcuate, two-fifths as long as the body in the male, finely but strongly punctato-sulcate, separated from the eyes at the sides by a deep vertical groove; antennæ inserted just behind the extreme apex, very slender, the second funicular joint longer than the first. *Prothorax* one-fifth wider than long, the sides parallel, broadly, feebly, evenly arcuate nearly to the apex, then rounded convergent and constricted; apex broadly arcuate and nearly three-fourths as wide as the base; disk with extremely large deep and closely crowded foveæ, each bearing a short anteriorly directed seta; surface evenly convex but finely, very strongly carinate along the middle. *Elytra* one-half wider than the prothorax, two and one-half times as long, one-third longer than wide, ovoidal, the sides becoming parallel toward base; humeri widely exposed, rounded; disk with unimpressed series of coarse deep close-set punctures; intervals flat, the alternate broadly, feebly carinate, the carinæ entire. *Abdomen* coarsely, closely punctate. *Legs* moderate, the femora uni-dentate. Length 4.3 mm.; width 2.2 mm.



Texas (Austin).

This is an interesting species, allied to *naso*, but having the antennæ of the male still more apical in insertion, and the pronotal sculpture nearly as in *fissunguis*. A single specimen.

**C. integer** n. sp.—Oblong-oval, moderately convex above, dull, black, the elytra and legs with a feeble piceous tinge; pubescence of the elytra not very dense, consisting of short recumbent hairs, ochreous or fulvous in color, nearly evenly distributed and scarcely at all mottled, mixed with short sparse setæ, not paler or denser behind the middle, the pronotum sparsely setose. *Head* densely and rather finely punctate, the yellowish pubescence not extending beyond the front; beak long, slender, arcuate, about one-half as long as the elytra in the male, strongly sulcate, the antennæ inserted beyond apical third. *Prothorax* very nearly as long as wide, the sides broadly rounded anteriorly, becoming parallel and nearly straight in basal three-fifths, finely, moderately constricted just behind the apex, the latter not more than one-half as wide as the base; disk coarsely, extremely densely, unevenly and subconfluently punctate, evenly convex and with a fine entire median carina. *Elytra* one-half wider than the prothorax and not quite three times as long, two-fifths longer than wide, the sides becoming subparallel in basal half; humeri right, widely exposed but rounded; disk with series of moderately large deep close-set punctures, the alternate intervals with fine strongly-marked entire carinæ. *Abdomen* coarsely, very deeply and densely punctate. *Legs* long; femora moderately robust, subfusiform, obtusely and very feebly uni-dentate, the toothed appearance caused principally by the abrupt and deep subapical emargination; tarsal claws divergent, strongly toothed. Length 6.0 mm.; width 2.9 mm.

Arizona (Tuçson).

The single male represents a species allied to *naso*, but with the pubescence of the elytra much sparser and not at all condensed or whiter behind the middle, and the pronotal sculpture more than twice as coarse, being fully as coarse as in *geminatus*. Both this species and *carinifer* have the peculiar oblong-oval form and general rostral structure of *naso*, and should evidently be associated with it.

**C. duplex** n. sp.—Robust, suboval, strongly convex, blackish-piceous, the elytra rufous; vestiture of the anterior parts very sparse, in the form of long stiff anteriorly directed setæ, on the elytra of moderately dense, somewhat uneven prostrate hairs, coarser denser and paler yellowish toward the humeri and transversely behind the middle, also with long stiff erect setæ. *Head* densely punctate and with sparse subrecumbent yellow hairs, the front with a deep median fovea; eyes moderate, remotely separated; beak moderately thick, feebly, evenly arcuate, fully as long as the head and prothorax, very deeply, longitudinally punctato-sulcate, strongly carinate along the middle; antennæ inserted at apical third, the second funicular joint very long, about

as long as the first and twice as long as the third. *Prothorax* very nearly as long as wide, the sides subparallel and just visibly arcuate in basal two-thirds, then convergent and rather strongly constricted, the apex somewhat strongly arcuate, three-fourths as wide as the base; disk very coarsely, deeply punctate, the punctures even but closely crowded and polygonal, without trace of any kind of median line. *Elytra* three-fifths wider than the prothorax, two and two-fifths times longer, only slightly longer than wide, the sides becoming straight and nearly parallel in basal half; humeri right, narrowly rounded, broadly exposed at base; disk with series of rather coarse punctures; intervals three, five, seven, eight and nine more or less strongly and uninterruptedly carinate. *Abdomen* coarsely deeply and densely punctate. *Legs* not very robust, the femora with a single fine tooth; claws feebly divergent acutely toothed internally near the base. Length 4.3 mm.; width 2.3 mm.

California. Mr. Harford.

Somewhat resembles *fissunguis* in form, but differs in the alternately broadly carinate elytral intervals and the long bristling erect setæ, as well as in the structure of the claws. The precise locality is unknown, but is in all probability southern, as *Conotrachelus* does not appear to enter the true Pacific coast fauna.

**C. rotundus** n. sp.—Robust, oval, convex, black, the legs rufescent; vestiture of the pronotum sparse, of the elytra rather dense and consisting of very short robust subrecumbent squamules, smaller even and ochreous on the alternate intervals, whiter broader and submaculate on the others, the upper surface throughout with stout erect clavate bristles, rather sparsely but evenly distributed and moderate in length. *Head* finely, very densely punctate; eyes remote; front and basal parts of the beak densely squamulose; beak rather thick, evenly arcuate, fully as long as the head and prothorax, deeply, longitudinally sulcate; antennæ inserted near apical third, rather stout, the second funicular joint scarcely as long as the first. *Prothorax* small, two-fifths wider than long, the sides feebly convergent from the base and rather strongly arcuate, more strongly convergent near the apex but not distinctly constricted; apex broadly arcuate and about three-fourths as wide as the base; disk with extremely coarse uneven and densely crowded foveæ, the surface rough but evenly convex and without median line. *Elytra* abruptly four-fifths wider than the prothorax, not quite three times as long, not longer than wide, the sides parallel and nearly straight to the middle, then convergent and rounded feebly sinuate before the apex; disk with broadly, deeply impressed series of moderately large deep punctures, the intervals nearly equal throughout and broadly, evenly convex, not in the least carinate at any point. *Abdomen* rather coarsely, densely punctate. *Legs* not very stout, the femora each with a single rather small but distinct tooth; tarsal claws rather divergent, bent downward near the base and with a long straight internal tooth near the base, widely diverging from the claw and almost equalling it in length. Length 3.0 mm.; width 1.9 mm.

Texas (near Austin).

A distinct species, easily distinguishable by its rather small size, obese form and peculiar thick clavate bristles. Together with *duplex*, it should be placed at the end of LeConte's group "I b," but there are no described species with which either of them can be compared.

The genera allied to *Ryssematus*, which have thus far occurred within the United States, may be readily distinguished as follows:—

Intermediate coxæ narrowly separated; second ventral segment not as long as the next two combined.

Tarsal claws unequally cleft, approximate but not connate at base.

**Ryssematus**

Tarsal claws simple, stout, subparallel, subconnate at base, the suture distinct.....**Chalcodermus**

Intermediate coxæ widely separated, the mesosternum between them depressed and flat; second ventral segment longer than the next two; tarsal claws small, slender, approximate at base but free.....**Chaleponotus**

**RYSSEMATUS** Chev.

*R. pruinus* Sch. is somewhat aberrant in its more elongate-oval form and in the longer flatter abdominal segments, also in its very slender beak, joined at the lower part of the head at an obtuse angle.

**R. ovalis** n. sp.—Evenly oval, strongly convex, shining, glabrous, dark rufo-testaceous throughout. *Head* strongly convex, finely, densely punctate, with a small interocular fovea; eyes moderate, unusually distant, separated by rather less than their own width above; beak rather slender, evenly, moderately arcuate, shining, finely, sparsely lineato-punctate, a little longer than the head and prothorax; antennæ inserted just behind the middle, the scrobes horizontal, nearly attaining the lower portion of the eye; funicle long, slender, all the joints longer than wide, the first almost as long as the next three, second but slightly longer than the third, the club moderate, scarcely longer than the three preceding joints, oval, abrupt. *Prothorax* not quite twice as wide as long, the apex strongly constricted and tubulate, less than one-half as wide as the base; sides evenly convergent and arcuate from the base, the latter transverse, broadly, feebly bisinuate and with the usual narrow declivous margin; disk finely, deeply strigilato-punctate, the strigæ externally oblique anteriorly, the median line very fine and not distinctly cariniform. *Elytra* slightly wider than the prothorax and nearly three times as long, oval, the sides becoming parallel near the base, the humeri obliquely, feebly rounded externally to the prothorax and not exposed at base; disk with

strongly impressed striæ of moderately coarse deep elongate punctures, the intervals equally convex, becoming somewhat acute toward apex, finely and unevenly punctate along the sides of the grooves. *Abdomen* finely, rather sparsely punctate. *Legs* short, the femora very robust, the denticle strong; tibiæ stout, bent toward base, enlarged toward, and externally prominent at, the apex. Length 3.8 mm.; width 2.0 mm.

Texas.

A rather small, evenly convex and isolated species, having the eyes much more widely separated than in any other form which I have seen. The structural characters are, however, all of this genus. The ocular lobes are moderately well developed as usual in this group.

*Chalcodermus* includes but three species within our faunal limits, —*æneus*, *inæquicollis*, and *collaris*. The species identified by LeConte as *spinifer* Boh., belongs to a widely different tribe of Curculionidæ.

#### CHALEPONOTUS n. gen.

This genus is allied to *Chalcodermus*, but differs in the following characters:—

Antennal scrobes feebly descending to the lower angle of the eyes, the basal joint of the funicle not as long as the second. Second abdominal segment much longer than the next two combined, the suture broadly, evenly angulate throughout its width. Middle coxæ widely separated. Tarsal claws small, slender, approximate at base but not at all connate.

It also differs in many other features, the body, for example, being more finely sculptured, and the elytral intervals elevated as in many species of *Ryssematus*. The mandibles are very thick, strongly, evenly arcuate in external outline, the apex prolonged and acute.

**C. elusus** n. sp.—Oval, convex, shining, black, glabrous, each puncture bearing a very minute seta. *Head* finely, not very densely punctate; eyes rather distant, separated by nearly their own width on the front; beak rather slender, cylindrical, evenly, feebly arcuate, as long as the head and prothorax, finely, sparsely punctate, shining, the antennæ inserted a little beyond the middle, the second funicular joint elongate, fully as long as the next two, outer joints thicker, the seventh scarcely as long as wide, club scarcely longer than the three preceding joints, oval, pointed, not very abrupt. *Prothorax* scarcely more than one-fourth wider than long, subconical, the sides evenly convergent and broadly arcuate from the base to the distinct but not strong subapical constriction, the apex arcuate, a little more than one-half as wide as the base; disk finely, deeply and evenly punctate, the punctures separated



by nearly their own widths, with a narrow impunctate spot at the middle. Scutellum small, tumid. *Elytra* one-third wider than the prothorax, two and one-half times as long, ogival, the sides becoming scarcely parallel at base, the humeri oblique to the base of the prothorax; disk with fine impressed striæ, having moderately small deep elongate and remote punctures, wider than the striæ, the intervals equal, strongly, angularly convex, with a feeble series of small punctures at each side of the summit. *Abdomen* finely, sparsely punctate. *Legs* moderate; femora not very stout, the denticle strong, inclined; tibiæ rather slender. Length 4.0 mm.; width 2.0 mm.

#### Indiana.

Easily distinguishable by the fine even separated punctures of the prothorax, the latter being unusually elongate. A single specimen.

### ACAMPTUS Lec.

This is a conspicuously distinct and aberrant genus with the metepimera invisible, the episterna distinct, the anterior coxæ large, prominent, contiguous but excavated internally to receive the very short thick beak, the eyes concealed in repose, antennal club solid, and third and fourth abdominal segments short. The tibiæ terminate in an unusually large internal spur and the tarsi are slender and cylindrical, with the third joint undilated; the claws are slender, free and divergent. The body is narrow and elongate, bristling with thick erect clavate setæ. The two species may be thus distinguished:—

*Elytra* shorter, scarcely more than one-half longer than wide and not twice as long as the prothorax, the latter broadly and feebly constricted behind the apex; dorsal bristles short and sparse throughout, the elytral ridges moderate.....**rigidus** Lec.

*Elytra* much longer, fully three-fourths longer than wide and more than twice as long as the prothorax, the latter broadly and deeply constricted behind the apex; dorsal bristles twice as long and very close-set, extremely robust and squamiform; elytral ridges strong. Body elongate, parallel, subcylindrical. Head and beak densely squamose, the latter bristling with erect scales especially toward base, not more than two-thirds as long as the prothorax, the antennæ inserted near the middle, the funicle glabrous, the basal joint about as long as the next two, outer joints gradually thicker, coarctate, club rather small. Prothorax fully as long as wide, the apex broadly arcuate and slightly narrower than the base, coarsely, indistinctly punctate. Scutellum small, distinct. *Elytra* one-third wider than the prothorax, the sides straight and nearly parallel in basal three-fourths, each with four ridges bearing long erect close-set scales, the intervals alutaceous, biserially punctate. Length 4.3 mm.; width 1.65 mm. New York.....**echinus** n. sp.

The vestiture is pale yellowish in color throughout, the integuments in *echinus* being dark red-brown. In both of the species the prothorax is very obliquely truncate at the sides, so that the head and beak are invisible from above; the ocular lobes are small. The antennal funicle is 7-jointed and not 6-jointed as indicated in the original description.

#### MICROMASTUS Lec.

The principal sternal characters of this genus appear to have been in great part misconceived by the author. The beak is moderately thick and perfectly free, the prosternum broadly, feebly impressed, the impression punctate, setose and much wider than the beak, the anterior coxæ large, conoidal, prominent and subcontiguous. The intermediate coxæ are somewhat widely separated, the mesosternum between them transversely tumid, densely punctate and setose. The metasternum is only moderately short and is longer than in *Acalles*; epimera and episterna both invisible, the third and fourth abdominal segments short. *Micromastus* is an isolated genus intermediate between *Conotrachelus* and *Acalles*.

#### ACALLES Schönh.

The following is a large species belonging in the neighborhood of *nobilis*:—

**A. profusus** n. sp.—Oval, convex, black rather sparsely clothed with large recumbent scales, without erect setæ, the scales dark brown in color but in great part white and denser on the head and basal parts of the beak, in several small isolated spots on the prothorax, on the elytra especially near the sides in basal fourth and in a transverse band near apical fourth, on the femora toward apex and throughout the tibiæ. Head and beak rather coarsely, densely punctate, the latter finely carinate along the middle, rather longer than the prothorax; antennæ inserted at the middle. Prothorax very nearly as long as wide, the sides broadly arcuate, somewhat more convergent toward apex, the subapical constriction fine; apex broadly arcuate and a little more than three-fourths as wide as the base; disk coarsely, very densely punctate, the median impunctate carina strong but not entire. Elytra oval, more than twice as long as the prothorax, and, in the middle, nearly one-half wider; foveæ very large, deep and close-set, each with a rather small subquadrate scale. Abdomen coarsely, rather closely punctate. Length 7.5 mm.; width 3.7 mm.

Texas.

Differs from *porosus* and *basalis* in its larger size and strongly

carinate pronotum, and from *nobilis* in its less inflated elytra and the dense white scales covering the basal third of the beak.

### CANISTES n. gen.

This genus is founded upon a remarkable species somewhat resembling an unusually robust *Calandrinus*. It is however allied to *Acalles*, as may be seen from the following diagnosis:—

Body oblong-oval, strongly convex. Beak moderate in length received in a very deep and abruptly limited sternal sulcus, extending almost to the metasternum. Eyes not very large, almost completely concealed in repose. the ocular lobes moderate. Antennæ inserted just behind the middle of the beak, the funicle 7-jointed, slender, the basal joint not quite as long as the second, the latter nearly as long as the next three combined; outer joints but slightly thicker; club abrupt, rather large, elongated, cylindric-oval, fully as long as the preceding five joints, very densely pubescent, solid but with a distinct apical segment. Metasternum very short, the episterna distinct, parallel, the epimera not visible. Abdomen with the first suture distinct, broadly, strongly arcuate, the second segment much longer than the next two together. Legs thick and robust; femora unarmed; tibiæ aberrant, the intermediate and posterior gradually and rapidly increasing in width to the middle, then abruptly narrowed, the apical half parallel and not wider than the base, the inner side straight throughout; tarsi short, slender, the third joint dilated and bilobed; claws small, simple, very slender, free and divergent. Scutellum completely obsolete.

*Canistes* differs greatly from *Acalles* in abdominal structure, but resembles *A. nuchalis* not only in this feature, but in the broadly visible met-episterna. The new genus which must be formed for *A. nuchalis* will however differ from *Canistes* in its distinctly annulated antennal club and normal tibiæ. In general facies *Canistes* departs widely from any other type of North American cryptorhynchs.

**C. schusteri** n. sp.—Subparallel, black, the antennæ rufous with the club still paler and subsericeous; body sparsely and very unevenly squamose, the head extremely densely clothed with small fulvous recumbent scales, the pronotum with some similar but more elongate scales toward the sides and also bristling with short erect and sparse setæ, especially toward apex, the elytra smooth, alutaceous almost glabrous, with a few widely scattered scales of various shapes, some recumbent, others erect, especially visible toward base, in a transverse line at apical third, and thence narrowly along the suture to the apex, the abdomen with a few elongate and widely dispersed scales; legs densely and conspicuously clothed throughout with small recumbent brown scales, erect and bristling externally along the tibiæ. Head densely punc-

tate; beak feebly arcuate, not quite as long as the prothorax, smooth, shining and finely, sparsely punctate except in less than basal half, where it is punctate and squamose. *Prothorax* slightly wider than long, wider at the middle than at base, the sides in basal half nearly straight, strongly convergent and deeply sinuate anteriorly, the constriction very large, deep, extending entirely across the dorsal surface; disk coarsely perforato-cribrate, the punctures separated by much less than their own diameters, the interspaces flat and polished, without modified median line. *Elytra* scarcely wider than the prothorax, two-thirds longer, narrowed and broadly constricted behind, the apex narrowly obtuse; disk with very fine sparse punctures, not striate, the punctures however becoming coarse and seriate very near the base. *Abdomen* finely, sparsely punctate, smooth and polished toward base. Length 3.3 mm.; width 1.6 mm.

Missouri (St. Louis).

The single specimen was discovered by Mr. Moritz Schuster of St. Louis, to whom it gives me pleasure to dedicate a most interesting addition to our Cryptorhynchini.

#### TYLODERMA Say.

This genus is widely differentiated from Cryptorhynchus by the short thick beak, consequently received in a much more shallow emargination of the tumid mesosternum, by the small eyes, almost completely concealed in repose by the ocular lobes, and by the six-jointed antennal funicle; in addition, it should be stated that the femora are unarmed and are only moderately stout. The third tarsal joint is dilated and bilobed, and the tarsal claws are small slender free and simple. The species usually vary greatly in the size of the body and in intensity and coarseness of sculpture, especially that of the elytra.

In a perfectly natural succession of the North American forms we can readily recognize four typical groups, represented respectively by *foveolata*,<sup>1</sup> *fragariæ*, *variegata* and *ærea*, the species in each group being rather closely allied among themselves. The

<sup>1</sup> It is desirable to make the rules of nomenclature as uniform as possible, and independent of linguistic exceptions. This can be accomplished in one direction by adopting a constant gender for each particular ending of the generic symbol, taking as a guide the general Latin rule in each case. In this instance, it is the general rule that words ending in "a" are feminine, consequently all generic symbols ending in "a," of whatever derivation, should require a feminine termination in the specific word. It would be a decided advance if a table of genders could be drawn up and agreed to, for every possible ending of the generic symbol.



second of those mentioned is monotypic and is perhaps the most aberrant in general form and habitus. The species occur throughout the United States, and are also well represented in Brazil; those which I have been able to study may be characterized as follows:—

Body more or less dull, very coarsely, deeply sculptured, the prothorax with large uneven foveæ.

Elytra with a squamulose spot at each side of the scutellum.

Elytral series becoming subobsolete and feebly punctate near the apex.

Pronotal foveæ much larger than the scutellum; vestiture composed of brownish-white squamules.....1 **foveolata**

Pronotal foveæ sensibly smaller and more distant, not much larger than the scutellum at any point; squamules broader in form and white.

**2 morbillosa**

Elytral series distinct throughout, the punctures of the two series nearest the suture on each deep and large to the apex; body much narrower and more cylindrical, the prothorax from above not constricted at the sides toward apex .....3 **angustula**

Elytra without trace of a squamulose spot near the scutellum; elytral series broadly, deeply impressed to the apex; prothorax not sensibly sinuate at the sides anteriorly; humeri much less broadly exposed, not at all truncate at base but broadly rounded to the base of the prothorax.

**4 contusa**

Body smoother and more shining, glabrous or very sparsely and unevenly pubescent, less distinctly polished in *fragariæ*, the pronotum punctate rather than foveate.

Elytra oval, widest near basal third; pronotum very coarsely deeply and densely punctate; integuments in great part rufo-piceous...5 **fragariæ**

Elytra becoming parallel and straight at the sides toward base.

Integuments more or less pale; pronotal punctures coarse uneven and impressed.

Prothorax rather longer than wide, densely and confusedly punctured toward apex; elytra black, sparsely mottled with rufous.

**6 variegata**

Prothorax not as long as wide, much more broadly inflated toward base, remotely and unevenly punctate throughout; elytra rufous, occasionally very distantly and just perceptibly mottled with blackish: beak shorter .....7 **rufescens**

Integuments black or piceous-black, often æneous, rather shining; pronotum more or less minutely punctate.

Elytral humeri very narrowly exposed at base .....8 **baridia**

Elytral humeri broadly exposed.

Upper surface with very sparse whitish recumbent hairs.

**9 subpubescens**

Upper surface glabrous.

Punctures of the pronotum strong though sparse throughout; body rather robust .....10 **nigra**

Punctures of the pronotal disk very fine or subobsolete; body narrower.

Punctures of the pronotal flanks strong and unevenly distributed over the entire surface.....11 **aerea**

Punctures of the flanks entirely obsolete, except in the subapical constriction .....12 **punctata**

*T. longa* Lec. (Proc. Am. Phil. Soc., XV, p. 248) belongs to *Cryptorhynchus* as at present organized, and has the eyes large and approximate, as usual in that genus. I have before me one or two species from Brazil, which are similarly elongate-cylindrical in form and otherwise closely allied to *longa*. In these forms the antennal funicle is short and 7-jointed, the outer joints very short, gradually slightly thicker and coarctate; they should perhaps form a distinct genus.

1 **T. foveolata** Say.—Curc., p. 19; Ed. Lec., I, p. 284; Germ.: Sch. Curc., IV, p. 140 (*Cryptorhynchus*); Horn: Proc. Am. Phil. Soc., XIII, p. 468 (*Analcis*).

Oblong-oval, strongly convex, black and dull throughout, glabrous but with small patches of small slender dense recumbent and whitish scales, of which a small spot at the middle of the vertex and another larger and more elongate between the eyes, a short line at the apex of the pronotum and an obliquely arcuate series from before the middle to near the sides of the base, numerous irregular spots on the elytra and a broad uneven band at apical fourth, are especially noticeable. Head and beak not very coarsely but rather closely and distinctly punctate, with a feeble frontal puncture. Prothorax scarcely as long as wide, strongly rounded at the sides, the latter convergent and broadly sinuate toward the broadly arcuate apex; disk with extremely coarse, deep, uneven but rather close-set foveæ. Elytra between one-third and one-fourth wider than the disk of the prothorax, the sides subparallel and nearly straight in basal two-thirds, the humeri right but narrowly and obliquely subtruncate; disk with unimpressed series of extremely large deep uneven foveæ, which become almost obliterated toward apex. Length 3.7–5.8 mm.; width 1.5–2.7 mm.

The large series before me is from New Jersey, Pennsylvania and Iowa; it is also said to occur in Georgia. In well preserved specimens each of the large foveæ of the pronotum bears a short stiff subclavate seta. The only remarkable variation is in the size of the body.

2 **T. morbillosa** Lec.—Pacif. R. R. Rep., App. 1, p. 58; Horn: Proc. Am. Phil. Soc., XIII, p. 467 (Analcis).

Closely allied to *foveolata*, but a little less robust, the elytra more elongate and with the small spots and posterior interrupted band composed of squamules which are whiter and slightly broader, the scales of the small spots on the head and flanks of the prothorax still broader. The prothorax is shorter, with the apex relatively wider, broadly arcuate, the sides in basal three-fifths nearly parallel and much less arcuate, thence feebly convergent and just visibly sinuate to the apex; foveæ smaller, rather sparser and very unevenly distributed. Elytra one-fourth wider than the prothorax and rather more than twice as long, the sides parallel and nearly straight in basal two-thirds, the apex narrowly parabolic; humeri right, slightly blunt; foveæ very large, uneven in outline, forming vague series and almost contiguous toward base, the series fine, slightly impressed and very feebly punctate toward apex, the two lateral more distinctly punctate and feebly carinate externally in apical half. Length 5.0 mm.; width 2.0 mm.

California (San Francisco). The unique type in the LeConte cabinet is the only specimen which I have seen. This species may possibly prove to be a geographical variation of *foveolata*, but it is impossible to pronounce any definite opinion until more specimens are discovered.

3 **T. angustula** n. sp.—Subelongate, strongly convex, black, the legs dark piceo-rufous; integuments dull, the elytra more shining, subglabrous but with a small condensed spot of recumbent squamules on the front, a few scattered squamules near the centre of the occiput, some very sparse indefinite spots on the prothorax and anterior parts of the elytra especially near the scutellum, an oblique spot near apical fourth and another between this and the apex of each elytron, the squamules whitish in color. *Head* and beak very unevenly but distinctly punctate, the former more sparsely and with an indistinct frontal fovea; beak very short, barely one-half longer than wide; antennæ rufous, the basal joint of the funicle very robust, not quite as long as the second which is slender and obconical; club densely clothed with short coarse pearly pubescence. *Prothorax* not quite as long as wide, the sides broadly, distinctly arcuate in basal three-fifths, becoming more convergent near the base, strongly convergent and nearly straight in apical two-fifths, the apex strongly arcuate and much narrower than the base; disk with extremely large deep uneven and partially confluent foveæ, without smooth median line. *Elytra* elongate, one-fifth wider than the prothorax and almost two and one-half times as long, subparallel, the apical portion ogival, with the extreme apex subtruncate; humeri broadly exposed, obliquely subtrun-

cate; disk with even series of very large deep rounded punctiform foveæ, the series impressed toward apex, especially the two nearest the suture, in which the punctures are but slightly smaller at the apex; punctures of the lateral series becoming very small at about posterior third but again larger toward the apex; intervals between the series each with an even series of very small remote punctures. Length 3.7 mm.; width 1.3 mm.

Texas (Austin).

The single specimen, which I took at the indicated locality, represents an interesting species somewhat allied to *foveolata*, but much narrower and differently sculptured toward the apex of the elytra.

**4 T. confusa** n. sp.—Rather narrowly oblong-oval, strongly convex, black throughout, the upper surface rather shining but with a distinct alutaceous lustre, almost glabrous, the squamules slender, recumbent, aggregated in two small spots on the head, one in the middle near the apex and two arranged transversely on the flanks of the pronotum, one or two very feeble spots on the disk of each elytron near basal third and in the usual transverse interrupted band at apical fourth, the squamules pale brownish in color. *Head* and beak finely, sparsely punctate, each puncture with a small seta, the front with a short longitudinal canaliculation connecting the two squamose spots. *Prothorax* nearly as long as wide, widest at the middle, the sides thence strongly convergent and straight to the apex, and feebly convergent and nearly straight to the base, the apex much narrower than the base and strongly arcuate; foveæ of the surface extremely large, deep, uneven, a wide median line smooth and very narrowly and feebly tumid. *Elytra* barely one-fourth wider than the prothorax, twice as long, parallel and straight at the sides in basal two-thirds, the apex parabolic; humeri rounded to the base of the prothorax; disk toward base with extremely large uneven semi-confluent foveæ, arranged in series, becoming smaller and distant but distinct toward apex, the series there being broadly deeply and conspicuously impressed. Length 3.3 mm.; width 1.3 mm.

Arkansas (Little Rock). Mr. H. F. Wickham.

A small species, allied rather closely to *foveolata*, but with a more shining and subglabrous surface, much larger denser and more conspicuous elytral foveæ, narrower bodily form, less widely exposed humeri and non-sinuate sides of the prothorax toward apex. In *foveolata* the elytral series are almost unimpressed near the apex.

**5 T. fragariæ** Riley—Third Ann. Rept. Ins. Mo., 1871, p. 42; Horn: Proc. Am. Phil. Soc., XIII, p. 469 (Analeis).

Ovate, subcuneate, strongly convex, rather robust, piceous, the elytra and legs rufous, the former each with a transverse blackish



clouded spot at the middle nearer the side than the suture, and another smaller and rounded at apical fourth; surface feebly shining, the vestiture very sparse, consisting of short robust recumbent hairs, yellowish in color and especially evident on the elytra near the base, in an oblique band just before the middle, and another at apical third not attaining the suture. Head and beak closely and deeply punctate, the former with a small depressed cluster of hairs at the middle of the vertex, separated from the beak by a broad transverse impression which is obsoletely foveate at the middle. Prothorax very nearly as long as wide, broadly rounded at the sides, narrowed and with the sides broadly, just visibly sinuate toward apex, the latter strongly arcuate; disk very coarsely deeply evenly and densely punctured throughout. Elytra at base not wider than the disk of the prothorax, three-fourths longer, widest at basal third where they are two-fifths wider than the prothorax, minutely punctulate throughout, more obsoletely in the black spots, and with obsoletely impressed series of very distant punctures, becoming coarse toward base and minute toward apex. Length 4.0-4.2 mm.; width 1.8-1.9 mm.

Illinois and Missouri. One of the most distinct species of our fauna, perhaps most closely allied to *variegata*, but radically different in its shorter oval and confusedly punctulate elytra, with the humeri scarcely at all exposed at base, and in its very dense cribrate punctures of the prothorax.

6 **T. variegata** Horn—Proc. Am. Phil. Soc., XIII, p. 468 (Analcis).

Oval, strongly convex, rather shining, in great part glabrous, black, the pronotum feebly rufescent near the apex and the elytra with small widely scattered rufous patches, of which a narrow oblique subsutural spot just before the middle and a wide, broadly and posteriorly arcuate band at apical third or fourth, are particularly noticeable, the rufous areas clothed rather sparsely with fine recumbent yellowish-white squamules, the black portions glabrous. Head and beak very densely, rather finely punctate and dull throughout, with a small impressed frontal fovea; beak in the female nearly twice as long as wide. Prothorax slightly longer than wide, the apex narrower than the base and strongly, evenly arcuate; punctures large, deep, unevenly distributed but rather close, fine toward apex. Elytra at base one-third wider than the prothorax, fully twice as long, the sides parallel and nearly straight in basal three-

fifths; punctures very large, uneven, impressed and rather distant, becoming smaller and with the series impressed toward apex. Length 3.0–4.2 mm.; width 1.3–1.75 mm.

The specimens in my cabinet are from Florida.

**7 T. rufescens** n. sp.—Oval, convex, shining, subglabrous, dark rufo-testaceous throughout, the elytra almost imperceptibly clouded with small, very remote and blackish spots, unevenly disposed; pronotum and elytra with a few widely scattered recumbent whitish squamules, rather long and very slender in form, and slightly more numerous in an oblique area on each elytron near apical fourth, very easily denuded. *Head* rather finely, sparsely punctate, with an impressed median fovea; beak in the female very short, scarcely one-half longer than wide; antennæ stout, the basal joint of the funicle very robust, rapidly narrowed to the base and not quite as long as the second, the latter much longer than the next two, slender, evenly obconical, outer joint gradually wider, the club robust, as long as the four preceding joints combined. *Prothorax* scarcely as long as wide, inflated and widest behind the middle, the apex much narrower than the base and strongly rounded; punctures coarse, impressed, very uneven, sparse and scarcely becoming finer toward apex, the median line narrowly and feebly tumid. *Elytra* at base one-fourth wider than the disk of the prothorax, distinctly more than twice as long, the sides parallel and nearly straight in basal half, then gradually rounded, the apex ogival; humeri right, narrowly rounded; striæ generally feebly impressed throughout the length, the punctures moderately large, impressed, uneven and remote, becoming very small feeble and elongate toward apex. *Legs* short, robust, rufo-testaceous, piceous near the coxæ. Length 3.2–4.3 mm.; width 1.3–1.8 mm.

Indiana.

This species is allied rather closely to *variegata*, but is easily distinguished by its slightly stouter form, pale coloration, wider and more inflated prothorax, much sparser punctuation throughout, the punctures rather larger on the prothorax but smaller and more even on the elytra, and by the shorter beak in the female.

**8 T. baridia** Lec.—Proc. Am. Phil. Soc., XV, p. 249.

Oval, gradually pointed behind, strongly convex, black throughout, smooth, shining although feebly alutaceous, glabrous, each puncture bearing an extremely small seta. Head and beak finely but strongly, not very densely and unevenly punctate, with a small and somewhat variable frontal puncture. Prothorax one-fourth wider than long, the sides broadly subangulate at the middle, feebly convergent thence to the base, strongly so and nearly straight to the apex, which is strongly arcuate and not more than one-half as

wide as the base; disk smooth, finely but deeply, remotely and evenly punctate. Elytra at base very slightly wider than the prothorax, fully two and three-fourths times as long, evenly gradually and acutely ogival, the sides becoming straight and parallel in somewhat less than basal half; humeri feebly, obliquely rounded externally, very narrowly exposed at base; disk with almost unimpressed series of small remote punctures, becoming nearly obsolete toward apex; intervals with a single uneven series of extremely minute feeble punctures. Length 3.8–4.2 mm.; width 1.65–1.8 mm.

Texas and Florida. Easily distinguishable by the oval, posteriorly pointed form and feebly exposed humeri.

9 **T. subpubescens** n. sp.—Narrowly elongate-oval, strongly convex, nearly smooth, slightly alutaceous in lustre, piceous-black with a feeble bronzy lustre, the upper surface with extremely sparse slender recumbent white hairs, only distinct on the pronotum laterally and along the lateral parts of the basal margin; on the elytra they are just perceptibly more numerous in an oblique area on each at basal third. Head convex, dull, minutely, sparsely but distinctly punctate, with a small vertical and larger frontal fovea; beak slightly rugulose. Prothorax about as long as wide, parallel and broadly arcuate at the sides to slightly beyond the middle, then gradually convergent, broadly and very feebly sinuate to the apex, the latter strongly arcuate and not more than three-fifths as wide as the base; disk very finely, feebly, rather evenly and not very sparsely punctate throughout, the punctures becoming larger but not denser on the flanks. Elytra at base barely one-fourth wider than the prothorax, but little more than twice as long, very gradually ogival, the sides becoming nearly parallel toward base; humeri rounded to the base of the prothorax; disk with very feebly impressed series of small, moderately distant punctures, which are rather deep and distinct toward base; the punctures disappear completely toward apex but the striae remain feebly impressed. Legs rufous. Length 2.9 mm.; width 1.2 mm.

Texas (Austin).

The single specimen represents a distinct species, somewhat intermediate between the *fragariæ* and *ærea* groups; it very closely resembles *ærea*, but is relatively narrower and may be readily distinguished by the long sparse hairs of the elytra.

10 **T. nigra** Casey.—Cont. Desc. Syst. Col. N. A., I, p. 56.

Broadly oval and robust, black with strong bronzy metallic lustre, polished. Head and beak dull, the former sparsely, finely punctate, with an elongate impression at the middle of the vertex; beak very densely punctate. Prothorax slightly wider than long, the sides in basal half subparallel and nearly straight, strongly convergent

thence to the apex and rather abruptly, subangularly sinuate at apical third; apex strongly arcuate, fully three-fourths as wide as the base; disk with rather small but deep, sparse and perforate punctures, becoming slightly larger but scarcely denser and unevenly distributed on the flanks. Elytra at base scarcely one-third wider than the prothorax, quite distinctly more than twice as long, gradually ogival to the apex, the sides becoming scarcely parallel toward base; humeri obtusely rounded and rather prominent, obliquely truncate at base; disk with unimpressed series of somewhat large, extremely remote and very feeble punctures in basal half only. Length 3.0–3.7 mm.; width 1.3–1.7 mm.

Indiana and Illinois. The series before me consists of eleven specimens; there is also a large series in the cabinet of Mr. Jülich. This species is allied to *ærea*, but differs in its larger size and more robust form, in the much coarser punctures of the disk of the pronotum, and in the elongate impressed line of the vertex.

11 **T. ærea** Say.—Curc., p. 29; Ed. Lec., I, p. 297; Rosensk.: Sch. Curc., IV, p. 279; Horn.: Proc. Am. Phil. Soc., XIII, p. 469 (Analeis); Lec.: l. c., XV, p. 248.

Narrowly oval, convex, highly polished, bright æneous in lustre, glabrous, each puncture with a minute seta; head, beak and legs dull, finely, strongly granulato-reticulate. Head and beak not coarsely but closely and conspicuously punctate, without distinct frontal fovea. Prothorax slightly wider than long, rather abruptly, moderately inflated at the middle, thence slightly narrower to the base; sides convergent and rather broadly, deeply sinuate to the apex, which is strongly arcuate and about three-fourths as wide as the base; disk with minute feeble sparse and evenly distributed punctures which become larger, deep and rather close-set on the flanks, but rather uneven in distribution and almost wanting toward base. Elytra at base two-fifths wider than the prothorax, two and one-half times as long, the apical half evenly gradually and acutely ogival, the sides becoming parallel and nearly straight thence to the base; disk with unimpressed series of rather small, remote but distinct punctures in basal third only, the series feebly impressed near the sides; remainder of the surface with scarcely a trace of punctuation. Length 2.2–2.8 mm.; width 0.9–1.25 mm.

New Jersey, Iowa and Texas. The measurements given are the extremes of a very large series. The sutural series of punctures is generally visible to a little beyond the middle.



12 **T. punctata** Casey.—Cont. Desc. Syst. Col. N. A., I, p. 57.

Elongate-oval, very strongly convex, polished, black with a strong bronzy lustre, glabrous. Head rather dull, finely, sparsely punctate, with a small vertical fovea, the impression between the head and beak deep but broadly rounded. Prothorax about as long as wide, the sides almost straight and evenly convergent from base to apex, but arcuate for a short distance in the middle; apex fully three-fourths as wide as the base, strongly arcuate; disk almost impunctate, the upper portion toward base with excessively minute and subobsolete sparse punctures; a transverse area just behind the apex is also more distinctly and confusedly punctate, the punctures becoming large and deep in a still narrower and more apical line on the flanks; remainder of the sides without distinct punctures. Elytra at base nearly one-third wider than the prothorax, two and one-half times as long, gradually ogival behind, the sides becoming subparallel in basal half; disk with unimpressed series of coarse, deep, very remote punctures, not extending behind the middle. Length 2.5–3.9 mm.; width 0.95–1.7 mm.

New York (Long Island) and Florida. A polished species resembling *ærea*, but larger, relatively somewhat narrower, with more elongate and more gradually narrowed elytra; it may always be easily recognized by the peculiar punctuation of the prothorax. The elytral punctures, as in *ærea*, vary greatly in size and depth, and, in one very small depauperate specimen from Florida, become nearly obsolete.

### **PHYRDENUS** Lec.

In this genus the anterior coxæ are only moderately separated, the excavation in the mesosternum being much wider, surrounded by a strongly elevated acute edge and not extending beyond the middle of the intermediate coxæ; the beak is strongly compressed toward base and dilated and flattened toward apex, as might be inferred from the relationship of the anterior coxal distance and width of the mesosternal sulcus. The two species in my cabinet may be thus distinguished:—

Second abdominal segment nearly as long as the next two; basal segment abruptly much more coarsely and almost uniformly punctate; median sulcus of the pronotum equal in width throughout, deep but not very wide, the pronotal sculpture coarse ..... **undatus** Lec.

Second abdominal segment but slightly longer than the third, the basal segment not more coarsely punctate but having in addition to the finer punctures others much larger and widely scattered. Head and beak roughly and densely squamose, the former strongly, transversely impressed; beak not quite as long as the prothorax, feebly bent, roughly and densely sculptured; antennæ inserted just beyond apical third, the second funicular joint but slightly shorter than the first, equal to the next two together, outer joints but slightly wider, club long, distinctly annulated. Prothorax very nearly as long as wide, angulate at the sides before the middle, the disk very uneven, the median impression broad and feeble; punctures very dense but even and rather fine. Elytra about twice as wide as the prothorax, not longer than wide; intervals alternately strongly ridged and flat; punctures coarse and rather uneven. Length 5.4 mm.; width 3.0 mm. Arizona.....**bullatus** n. sp.

*Bullatus* is larger and relatively broader than *undatus*. The vestiture in the single specimen before me is somewhat imperfect, but appears to be of the same general character as in *undatus*; the latter is moderately abundant from New York to Texas.

#### ZYGOPINI.

#### **PSOMUS** n. gen.

A distinct genus is rendered necessary for one of the most minute zygopides which I have seen. Its principal characters are the following:—

Body small, oval, convex, somewhat resembling *Orchestes*. Eyes large, finely faceted, narrowly separated on the front. Beak somewhat slender, received in repose in a moderately deep prosternal sulcus, thence passing over, but scarcely upon, the mesosternum. Antennæ very slender, the funicle long, filiform, the basal joint rather longer than the next two; second longer than the third; outer joints but slightly thicker; club very small, moderately thick, oval, not noticeably annulate. Mesosternum depressed, flat, very widely separating the coxæ. Met-episterna rather narrow, parallel, interposed between the posterior coxæ and the elytra. Abdomen nearly flat, the sutures straight, transverse, all deep and strong, the segments subequal in length. Pygidium completely covered. Legs moderate, the tibiæ and tarsi very short; tarsal claws small, divergent, bent downward near the base and obtusely toothed or lobed within.

The systematic position of *Psomus* is evidently near *Acoptus*, with which it agrees in sternal structure; the facies is however completely different, and structurally it differs in its very slender antennæ with small non-annulate club, short tarsi with the claws

somewhat appendiculate and not simple, in its still more equal ventral segments and relatively larger eyes. The femora are broadly sinuate beneath toward apex, but not in the least dentate.

**P. politus** n. sp.—Oval, strongly convex, highly polished, black, the tip of beak, antennæ, tibiæ and tarsi very pale luteo-flavate; femora black; body almost glabrous, the upper surface with a few remote inconspicuous setiform squamules, especially evident and somewhat bristling between the eyes, on the prosternum and flanks of the prothorax. Head finely punctate; beak a little more than one-third as long as the body, smooth, shining, rather coarsely but not densely, sublinearly punctate, the antennæ inserted rather behind basal third. Prothorax small, conical, three-fifths wider than long, the sides almost straight, subapical constriction very feeble; apex broadly arcuate, about two-thirds as wide as the base; disk finely but strongly, not closely punctate. Scutellum small, tumid, albido-setose. Elytra at base abruptly two-fifths wider than the prothorax, between three and four times as long; sides rounded, convergent and feebly sinuate toward apex, becoming parallel near the base; humeri rather tumid, obtuse; disk with very fine but distinct striæ, feebly, remotely crenato-punctate; intervals wide, broadly convex, each with a single series of extremely minute distant and feebly setiferous punctures. Abdomen rather closely, subrugosely punctate. Length 1.5–1.8 mm.; width 0.7–0.9 mm.

#### Indiana.

This is an interesting addition to the Zygopini of the United States and constitutes a widely isolated generic type. Two specimens.

#### ZYGOPS Schönh.

I have before me two species of this genus which may be thus characterized:—

Lateral vittæ and median pale spots of the pronotum abruptly defined; post-medial whitish spots of the elytra arranged transversely; upper portion of the pygidium black, except narrowly near the edges and along the subcarinate median line; abdomen with a denuded spot near each side of the fifth segment.....**seminiveus** Lec.

Lateral pronotal vittæ rather well defined, the median spots not at all defined, replaced by large indefinitely nubilate areas; post-medial spots of the elytra oblique; pygidium with mixed pale and dark scales; fifth ventral segment almost uniformly clothed throughout with white scales. Body otherwise nearly resembling *seminiveus*, the beak more coarsely and rugosely punctate and much less strongly carinate in the middle toward base. Length 7.7–9.0 mm.; width 3.9–4.8 mm. Texas (southwestern).

Mr. G. W. Dunn .....**suffusus** n. sp.

Besides the characters mentioned, it should be added that the elytral pale spots in *suffusus* are composed of white and pale brown scales, the larger white areas being narrowly margined with the brown tint, while in *seminiveus* all the scales are whitish.

#### BARINI.

This immense tribe forms an important subdivision of Lacordaire's second section of those apostasimerous phanero gnathic Curculionidæ, which have the antennal club articulate or divided by distinct sutures, and the third tarsal joint bilobed. There are, however, several important exceptions to these characters even in the tribe under consideration, and it may prove almost as natural to consider the Barini as forming one of the tribes in the second of two great primary divisions of the Curculionidæ—as limited by LeConte—based upon the form of the mesosternal epimera; the first having the epimera undeveloped laterally and the second having this part produced and angulate upward or ascending at the sides of the body, obliquely truncating the elytra at the humeri and often visible from above. At all events the latter is the principal structural character separating the Barini from other curculionides, and is the most constant and significant feature of the tribe.<sup>1</sup>

Among the few tribes possessing this peculiarity, the Barini may be known at once by the distinct scutellum, generally free beak with obliquely descending or inferior antennal scrobes and by the unemarginate prosternum, but it must be admitted that there seems to be quite as strong a bond of affinity between the Barini and Cryptorhynchini, as between the former and the Ceutorhynchini, with which they are to be associated by reason of mes-epimeral structure. Lacordaire distinguishes the Barini from the Ceutorhynchini principally by the presence of a distinct scutellum in the former; so, as in many other large and complicated divisions of the Coleoptera, we are forced to rely for tribal characters mainly upon habitus, supported by one or two tolerably constant special peculiarities. As thus defined by the conformation of the mes-epimera, the Barini include an extremely large proportion of all the special modifications of structure found elsewhere in the Curculionidæ.

<sup>1</sup> In the Zygopini it sometimes occurs it is true, but here it is always sporadic and of but little if any systematic value.



The beak may be excessively short and stout or correspondingly long and slender, arcuate or nearly straight or variously bent at different parts of its extent, divided from the head by a transverse constriction or not, and with the antennæ inserted at every conceivable point, from near the extreme apex as in the male of *Conoproctus 4-pustulatus*, to near the base as in *Simocopis* of Pascoe or our own *Plocamus*. The scrobes obliquely and rapidly descending or nearly horizontal, sometimes completely inferior, coalescent beneath toward base or remaining widely separated.

The antennæ are comparatively constant in structure, especially the funicle, which is invariably seven-jointed, with the basal joint, and more rarely also the second, elongate to a greater or less degree, the first sometimes as long as the entire remainder as in *Barinus*; the second joint is, however, almost always at least somewhat longer than the third. The club is modified to a very noticeable extent, but it is seldom that these variations of structure can be employed in differentiating the genera; it may be very small or conspicuously longer than the entire funicle as in *Orthoris*, and its basal joint may constitute from two-thirds of the whole to very much less; in *Centrinus acuminatus*, for example, the two basal joints together compose less than one-half of the mass, with the first much shorter than the second; the basal joint is frequently subglabrous, at least toward base, and especially in *Baris* with its immediate allies and in some of the subgenera of *Limnobaris*; in one of the subgenera of *Centrinus* (*Odontocorynus*) it becomes conspicuously modified in the male.

The mandibles vary greatly in structure, from stout, thick, arcuate and broadly decussate to the long, straight, prominent and perfectly non-decussate, without trace of internal denticulation, the latter type being nearly similar in shape, but not in plane of motion, to those of *Balaninus*, showing that *Centrinus* and *Balaninus* may have a certain obscure relationship apart from their general similarity of form. In *Eunyssobia* and *Plocamus* they move in a nearly vertical plane, precisely as in *Balaninus*, but in spite of all these resemblances I am of the opinion that *Balaninus* is more closely allied to the *Anthonomini*, and that it should constitute a simple tribe in that vicinity.

I have found the various modifications of the mandibles of positive value in delimiting the genera allied to *Centrinus*. It was the opinion of Lacordaire that the forms assumed by the mandibles were so erratic in this and allied tribes, as to be of very little use

in classification, and, assuming the definition and scope of certain genera as known to this author, such as the Schönherrian *Baridius* and *Centrinus*, there can be no doubt that he was entirely justified in coming to the conclusion expressed in the foot-note on page 3, vol. VII, of the "Genera." Whatever opinion may be held, however, concerning the usefulness of mandibular modifications for the purposes to which they are here applied, it can only be said that I have found the generic groups defined by them to be quite homogeneous within themselves in external appearance and distinctly separated from each other in general habitus, and these facts admittedly constitute one of the best tests of generic validity. In addition we are enabled in this way to really define and fix some tangible limits to the genus *Centrinus*, which has never been accomplished by any other means. The fact that the prosternal sulcus and degree of separation of the anterior coxæ prove to be of uncertain value for generic definition in *Centrinus* and its immediate allies, because of the marked sexual divergencies in the conformation of these parts in many species, taken in connection with the intro-generic homogeneity of facies of the groups defined by mandibular structure, prompts me to believe that we have here, at least, a practical solution of one of the most perplexing problems of the *Curculionidæ*.

The prosternum is subject to almost every possible modification; it may be either perfectly flat or variously foveate or longitudinally sulcate to a greater or less degree. The sulcus when present does not generally receive the beak in repose, but there are at least three genera—*Coleomerus*, *Diorymerus* and *Aulobaris*—in which the beak can be placed in the groove just as in any normal cryptorhynch, and, in *Coleomerus*, the groove often extends posteriorly far into the metasternum; in the other two genera, however, it does not pass beyond the prosternum. The apical margin is usually entire, but frequently sinuate in the middle, and, at a short distance behind the apex, there is a more or less distinct transverse constriction. The degenerative remnants and modifications of the transverse constriction and longitudinal sulcus or of a combination of the two, frequently give rise to subapical foveæ of various forms, sometimes continued posteriorly by folds of the surface.<sup>1</sup> The anterior coxæ are of every

<sup>1</sup> In some genera the two subapical foveæ serve as receptacles for the robust basal joint of the antennal funicle, when the beak is placed closely against the body, these portions of the sulcus or constriction being therefore preserved for a useful purpose.

possible degree of separation, from complete contiguity as in an undetermined Brazilian genus which I have before me, to extreme separation as in some of the madaride genera; in our own genera they are always more or less separated.

The pygidium plays an important part in the classification of the Barini, but the weight attached to it was somewhat over-estimated by LeConte, for the degree of exposure of this part, as well as its relative departure from the vertical, often depends to a considerable extent upon the sex of the individual. In Baris, for example, the species as a rule have not only the pygidium, but in addition nearly the entire propygidium uncovered in the male, the female having merely the pygidium exposed. This sexual character is still more pronounced in some of the centrinide genera, in which there are many species having the pygidium exposed at apex in the male, but entirely covered in the female, and, in two of the species, forming the genus *Centrinogyna*, it is completely exposed, vertical and unusually large in the male, but oblique and practically entirely covered in the female. It is impossible, therefore, to divide the tribe into two perfectly natural groups based upon pygidial structure, but the latter is nevertheless very useful in characterizing the genera.

There are but few other points to which attention need be directed at the present time, in view of what has been already published. The eyes do not vary sufficiently to call for special remark; they are nearly always widely separated above and beneath, well developed and finely faceted; in *Coleomerus*, however, they are narrowly separated above.<sup>1</sup> The body is of nearly all possible shapes, from extremely slender and cylindrical as in *Barilepton* and the *Madopterides* through the oval and elliptical, convex and flattened forms, to the extremely robust and strongly rhomboidal outline of *Eurypages*, *Diorymerus*, *Pachybaris* and some other centrinides. The prothorax is frequently tubulate at apex. The scutellum is very variable in structure and vestiture. The met-episterna are narrow or broad, the legs short or long, with the femora dentate beneath as in many tropical types and, less distinctly, in our own *Madarellus* and *Pseudobaris*, or completely unarmed as in the majority of genera; the tibiae straight, or abnormal in structure as in *Eisonyx*, and almost

<sup>1</sup> In the Australian *Platyphæus lyterioides* the eyes are said by Pascoe to be very coarsely faceted and contiguous beneath.

invariably with a short acute internal spur at the apex. The tarsi may be shorter or longer than the tibiæ, generally with the third joint dilated and bilobed, but occasionally also with the second as widely dilated as the third as in *Barinus*; in *Calandrinus*, *Zaglyptus*, *Eunyssobia* and *Plocamus* the tarsi are very slender, with the third joint not or scarcely wider than the second, while in *Barinus bivittatus* they are extremely broad. The tarsal claws may be connate or divergent, rarely single; in *Centrinus senilis* Gyll., they become robust, and excavated along the under surface; they are never toothed, cleft or appendiculate, this being as singularly constant a peculiarity of the Barini, as the seven-jointed antennal funicle.<sup>1</sup> The structure of the abdomen is comparatively constant and of no value in classification as far as can be observed; the last three sutures are always posteriorly reflexed at the sides.

The secondary sexual characters of the male are numerous, varied and often of a decidedly radical nature. In many species of the genus *Centrinus*, for example, the male has a long corniform process before each anterior coxa and a deep prosternal fossa, while the female is devoid of the processes, and may not only have the prosternum flat or with a very feeble sulcus, but the coxæ also more widely separated. In some species of *Centrinus*, as before remarked, the basal joint of the antennal club is the only part subject to secondary sexual modification in the male. In conformity with a general rule in the Curculionidæ, the antennæ are usually inserted relatively nearer the tip of the beak in the male than in the female, the beak being nearly always smoother, somewhat longer,<sup>2</sup> less punctate, more slender and sometimes more strongly arcuate in the latter sex. The abdomen generally has, near the base, a small, moderately deep impression, as in many tribes not only of this but of other families. Finally, among the more special and singular secondary male characters, mention should be made of the dentate anterior trochanters of *Centrinus acuminatus* and *globifer*, and of a very remarkable structure which I have noticed in an undetermined Brazilian species, the sides of the prothorax behind the apex having a large impres-

<sup>1</sup> As a most notable exception, it should be stated that in the genus *Enops* of Pascoe, the claws are described as bifid; but the author appears to be in some doubt as to the true affinities of *Enops*, and it is quite possible that it will have to be referred to another tribe.

<sup>2</sup> In *Conoproctus* there is an extraordinary reversion of this rule, the beak in some species being much longer in the male than in the female.



sion, in the middle of which there is an erect transverse row of long acute spiniform teeth, the surface being perfectly smooth and normal in the female; there are doubtless many other special sexual characters of equal singularity among the tropical species; one of these will be noted under the genus *Madarellus*.

The thirty-nine genera which seem to be necessary for our species may be recognized as follows:—

- Pygidium more or less completely exposed in both male and female, and generally almost vertical.....2
- Pygidium oblique and entirely concealed in the female, sometimes with the mere apex exposed especially in the male, except in *Centrinogyna*, where it is vertical and completely exposed in the male.....17
- 2—Antennal club shorter, more robust, ovoidal or conoidal and more or less pointed, never fully as long as the preceding six joints combined; pygidium nearly vertical, except in the male of *Madarellus*; tibiæ usually longitudinally and feebly fluted and externally subcarinate.....3
- Antennal club elongate, densely pubescent, longer than the preceding six joints combined; pygidium rather oblique; anterior coxæ narrowly separated; prosternum more or less impressed along the middle, but never abruptly sulcate; tibiæ nearly smooth; claws free, divergent .....16
- 3—Tarsal claws free and more or less divergent .....4
- Tarsal claws connate at base, nearly parallel or feebly and gradually everted toward apex .....13
- 4—Second funicular joint short or moderate in length, never as much as twice as long as wide .....5
- Second funicular joint elongate, more than twice as long as wide and fully as long as the next two combined .....12
- 5—Anterior coxæ more or less approximate, never separated by a distance equalling their own width.....6
- Anterior coxæ remote, the prosternum generally broad and flat between and before them.....11
- 6—Prosternum never deeply and abruptly sulcate, although frequently feebly impressed along the middle .....7
- Prosternum narrowly, abruptly and deeply sulcate.....10
- 7—Beak separated from the head by a shallow impression which is often broadly angulate when viewed in profile.....8
- Beak separated from the head by a fine deep and abrupt groove; basal joint of the antennal club forming about one-half of the mass, more or less sparsely pubescent and shining .....9
- 8—Antennal club polished and subglabrous toward base.....**Baris**
- Antennal club finely and densely pubescent throughout; species generally minute and with scattered white scales, especially dense on the meso- and metasternal side-pieces and at the sides of the last three ventral segments.....**Plesiobaris**

**9**—Body stout and convex, the prothorax broadly constricted near the apex but not tubulate; vestiture generally distinctly squamiform and uniformly distributed ..... **Pycnobaris**

Body oblong-elongate, depressed, the prothorax strongly tubulate at apex; vestiture in the form of long robust setæ; sculpture of the pronotum extremely coarsely and deeply cribrate ..... **Stictobaris**

**10**—Anterior coxæ separated by not quite their own width; beak moderately slender, subgibbous at base ..... **Trepobaris**

**11**—Prosternum extending but slightly over the mesosternum and broadly, evenly arcuate, the surface transversely bituberculate just behind the coxæ; mandibles prominent, acute, non-decussate, with the internal emarginations very feeble; antennal club rather small; body deeply, rugosely sculptured and partially squamose; femora completely unarmed.

### **Glyptobaris**

Prosternum extending far over the mesosternum, transversely truncate or broadly sinuate and always more or less angulate at the sides of the process, the surface frequently transversely tumid just behind the coxæ; antennal club larger; pygidium more or less oblique in the male; mandibles generally prominent and not or only feebly decussate, but becoming arcuate and strongly decussate in some species of *Onychobaris*, always deeply notched within.

Anterior coxæ moderately remote; femora unarmed; body always deeply sculptured throughout and finely setulose ..... **Onychobaris**

Anterior coxæ very remote; femora minutely toothed, the anterior generally strongly and distinctly so; body deeply sculptured beneath but very feebly so above, subglabrous ..... **Madarellus**

**12**—Prosternal sulcus wide, deep, moderately abrupt, receiving the beak in repose ..... **Aulobaris**

**13**—Anterior coxæ widely separated ..... 14

Anterior coxæ narrowly separated, the prosternum broadly, feebly impressed along the middle but never sulcate; femora slender and completely unarmed; tibiæ nearly smooth, not fluted; tarsal claws frequently slightly unequal in length ..... 15

**14**—Prosternum with a wide, deep and abrupt excavation near the anterior margin, which rapidly becomes shallower posteriorly, disappearing before the coxæ; body smooth, polished and very feebly sculptured; femora unarmed ..... **Ampelogypter**

Prosternum deeply and abruptly sulcate along the middle, the sulcus very narrow and never receiving the beak, the latter moderately short and stout.

Pygidium small, flat, not at all prominent and partially covered by the elytra; elytral striæ deeply crenato-punctate, the intervals narrow and convex; femora unarmed ..... **Desmoglyptus**

Pygidium large, convex and prominent, not inflexed beneath and not at all covered by the elytra; striæ not crenate, the intervals flat but sometimes angularly prominent on the posterior declivity; the femora frequently armed beneath, near apical third, with a very minute subobsolete spiciform tooth ..... **Pseudobaris**

- 15**—Antennal club large, oval, very densely pubescent and nearly as long as the six preceding joints combined, a form suggestive of *Rhoptobaris*; pygidium convex, inflexed beneath, sinuating the fifth segment when viewed vertically.....**Hesperobaris**

Antennal club much smaller.

Beak slender, longer than the prothorax, separated from the head by a very feeble impression; integuments subglabrous; species minute.

**Microbaris**

Beak robust, shorter, separated from the head by a deep angular impression; integuments more or less densely squamulose; species large.

**Trichobaris**

- 16**—Prosternum not distinctly tumid before the coxæ, very broadly and scarcely visibly impressed; beak a little more robust, separated from the head by a very broad feeble and indefinite impression; scutellum flat, triangular, sculptured like the surrounding surface; prothorax larger; body more elongate.....**Rhoptobaris**

Prosternum strongly tumid before each coxa; beak slender, separated from the head by a distinctly marked transverse impression; scutellum subquadrate, slightly transverse; prothorax small, subconical....**Orthoris**

- 17**—Mandibles normal in action, their plane of motion horizontal or nearly so; body without erect setæ except in *Zaglyptus*.....18

Mandibles with their plane of motion almost vertical, the upper part of the condyles nearly in mutual contact within a small emargination of the epistomal lobe, the lower condylic fissures very near the buccal opening; surface of the body bristling with sparse erect spines or spiniform setæ; tarsi narrow, the third joint not sensibly dilated; antennæ inserted on the under surface of the beak.....31

- 18**—Tarsi with two free and more or less divergent claws.....19

Tarsi with the claws connate or single .....28

- 19**—Mandibles prominent, not decussate when closed or at most very feebly so.....20

Mandibles not at all prominent, thick, arcuate, strongly decussate when closed and deeply notched at apex .....23

- 20**—Mandibles with the inner edge always completely devoid of denticles or emarginations, generally straight but sometimes feebly arcuate and dehiscent toward apex, in which cases the mandibles cannot be placed in mutual contact throughout their length.....**Centrinus**

Mandibles with the inner edge straight, but more or less finely denticulate or crenulate.

Antennæ inserted far behind the middle of the beak.....21

Antennæ inserted at or beyond the middle of the beak; body oval or narrower and subparallel.....22

- 21**—Anterior coxæ narrowly separated; species small and densely squamose.

**Centrinopus**

Anterior coxæ widely separated.

Beak separated from the head by a very deep transverse constriction; scutellum large, quadrate or trapezoidal; integuments with dense abruptly defined squamose vittæ; body broadly rhomboidal.....**Linonotus**

- Beak separated from the head by an extremely feeble transverse impression, which is foveate in the middle; scutellum small, rounded, emarginating the thoracic lobe; body subglabrous and broadly oval.....**Pachybaris**
- 22**—Anterior coxæ narrowly separated; mandibles with the outer edge evenly and feebly arcuate, not denticulate.  
Prothorax not tubulate at apex.  
Metasternum very short, the intermediate and posterior coxæ separated by a distance which is much less than the length of the post-coxal portion of the first ventral segment.....**Microcholus**  
Metasternum much longer; body narrower, convex, oblong-oval, densely squamose, the scutellum conspicuously so.....**Nicentrus**  
Prothorax strongly constricted behind the apex, the latter tubulate; metasternum long.....**Centrinites**
- Anterior coxæ widely separated; mandibles more or less dentate externally, particularly near the base.  
Pygidium oblique, completely concealed in both sexes, or with the mere apex exposed.....**Calandrinus**  
Pygidium fully exposed, unusually large, vertical, convex and very conspicuous in the male, but oblique and practically entirely concealed in the female.....**Centrinogyna**
- 23**—Elytral striæ normal, always distinct, not foveate at base.....24  
Elytral striæ almost completely obsolete, each terminating at base in a deep, posteriorly attenuate fovea.....27
- 24**—Third tarsal joint dilated and bilobed; body without erect bristles.....25  
Third tarsal joint slender, obconical, not in the least dilated; body with erect bristles.....26
- 25**—Metasternum long, much more than one-half as long as the met-episterna; prosternum with or without corniform processes in the male, widely or narrowly separating the coxæ, generally flat, but sometimes deeply excavated in the male, or otherwise modified.....**Limnobaris**  
Metasternum shorter, about one-half as long as the met-episterna; body more broadly oval and convex; prosternum never armed in the male.  
Antennal club small or moderate; prosternum flat or broadly impressed, sometimes more deeply excavated anteriorly; vestiture very sparse but distinct.  
Prothorax broadly constricted anteriorly but not tubulate; prosternum flat, not impressed, not excavated anteriorly but with a fine deep and even transverse constriction.....**Oligolochus**  
Prothorax tubulate; prosternum broadly impressed, deeply excavated anteriorly.....**Idiostethus**  
Antennal club very large, elongate; prosternum narrowly and deeply sulcate along the middle; body almost completely glabrous, polished, the setæ extremely minute throughout.....**Stethobaris**
- 26**—Body minute, the bristles very long and conspicuous.....**Zaglyptus**
- 27**—Body oval, very convex, subglabrous, the prothorax very strongly tubulate.....**Oomorphidius**



**28**—Elytral striæ obsolete, represented at the base by small and not very conspicuous foveæ; body subglabrous; tarsal claws single.....**Eisonyx**

Elytral striæ normal, distinct, not foveate at base.

Tarsal claws two in number, completely connate in basal third to half....29

Tarsal claws single.....30

**29**—Beak long, slender, the antennæ inserted behind the middle; elytral striæ very fine but broadly, feebly impressed and very coarsely punctate; body subglabrous and with remotely scattered white scales.....**Zygobaris**

Beak short and stout; body squamose.

Basal joint of the antennal funicle moderate in length; elytra with large remotely scattered white scales in addition to the denser squamules; species very small .....**Catapastus**

Basal joint of the antennal funicle very long, sometimes as long as the entire remainder; elytral vestiture often vittate or with denuded spots, but without widely dispersed coarser scales; species moderately large, more or less elongate-oval, or narrower and parallel, convex .....**Barinus**

**30**—Body cylindrical and very slender; basal joint of the antennal funicle long .....**Barilepton**

**31**—Beak long, very slender but strongly inflated behind the point of antennal insertion, separated from the head beneath by a deep transverse constriction; erect setæ spiniform and conspicuous .....**Eunyssobia**

Beak shorter, without basal constriction, the erect bristles much shorter.

**Plocamus**

### **BARIS.**

German.—Ins. Spec. Nov. 1824, p. 197.

*Baridius* Schönh. (pars).

This is a large genus of almost universal distribution, but much more developed in North and South America than in Eurasia. Assuming the definition of the genus given in the preceding table, the species occurring within the territory embraced by the present monograph are of an oval or oblong-oval convex form of body, with semi-glabrous and usually strongly shining integuments. As compared with most of the other genera of the tribe the sculpture is rather coarse and only moderately dense. The vestiture consists of small semi-erect or recurved setæ, which are always sparse and never broadly squamiform.

The rostrum is invariably short, often excessively so, never quite equalling the prothorax in length, and, in many cases, not more than one-half as long. On comparing this form of beak with that of *Centrinus*, *Limnobaris* or even *Onychobaris*, it can reasonably be inferred that the habits of the species are notably, if not essentially, different from those of the latter genera.

The legs are very short, the tibiæ strongly mucronate within at apex, and more or less strongly carinate and grooved along the sides, the tarsi moderate in development, with the third joint more or less broadly bilobed or emarginate; the unguis are somewhat variable in length, but never very long.

Our species can be readily divided into two groups, which might be considered of subgeneric value, were it not for the fact that *B. callida* constitutes a connective bond in the important character relating to the form of the scutellum. The first of these groups is characterized by a robust form of body, a greater development of the sparse setæ, broadly sinuate external outline of the tibiæ, feebly marked transverse impression at the base of the beak, and a transverse broadly impressed scutellum, the other by a variable but nearly always more slender form of body, less developed setæ, straight tibiæ, strongly marked basal impression of the beak, and a smaller subquadrate or rounded and unimpressed scutellum. In the first, the anterior coxæ are always very narrowly separated, while in the second they are generally much more widely so, although never very remote when compared for example with *Onychobaris*, their distance asunder being always less than their own width. I find no appreciable difference between the groups in the nature of the impression of the prosternum, the latter being very variable in degree; it is sometimes quite marked, but cannot well be made use of in a tabular arrangement of the species. It occasionally disappears completely.

The buccal opening is deep, and has, at the bottom, a long slender truncate process, serving as a pedestal for the mentum, the latter being small and obconical. In the species of the first group the sides of the buccal opening are more or less prolonged downward, forming lateral plates for the protection of the oral organs, especially developed in *strenua*. In the second group, however, the sides of the fissure are horizontal and perfectly continuous with the flat under surface of the beak. The mandibles are small, stout, arcuate and distinctly overlap when closed.

The sexual characters are more marked than in most of the other genera with exposed pygidium, the male being nearly always easily recognizable by the distinct impression at the middle of the abdomen toward base. It is somewhat singular that this impression, in the present case, is always more sparsely and finely punctured than the neighboring surface of the abdomen, while in *Blapstinus*, of the

Tenebrionidæ, possessing an entirely analogous abdominal impression, which might at first sight be supposed to have been developed from the same causes and for identical purposes, the impression is almost always notably more densely punctured than the surrounding surface. The beak is not subject to great sexual modification, although there are a few exceptions to this rule, as for instance *sparsa*, in which it is distinctly shorter in the male than in the female.

The following table probably includes a large proportion of the forms inhabiting the United States:—

Tibiæ sinuate externally and prominent at apex; anterior coxæ narrowly separated; impression between the head and beak feeble; setæ more developed, generally bristling also from the under surface of the beak; scutellum usually short, transverse and broadly, deeply impressed, nearly as in <i>Trichobaris</i> ; body never with æneous surface lustre .....	2
Tibiæ straight, occasionally with a small external dentiform process at apex but never broadly sinuate; anterior coxæ more widely separated; impression between the head and beak strong but always broadly angulate when viewed in profile; scutellum small, subquadrate or rounded, not broadly impressed; setæ generally inconspicuous; surface lustre frequently æneous .....	9
2—Scutellum transverse and impressed .....	3
Scutellum small, rounded, not transverse .....	8
3—Elytra at least twice as long as the prothorax, generally distinctly more .....	4
Elytra very distinctly less than twice as long as the prothorax .....	7
4—Elytral intervals strongly elevated, narrow and never more than slightly wider than the grooves, the second and third generally not at all wider than the others .....	5
Elytral intervals broader, flat and feebly elevated, the grooves unusually shallow; second and third intervals much wider .....	6
5—Elytral callus prominent, the elytra being abruptly and distinctly wider than the prothorax and with the sides parallel in basal two-thirds. Abdomen clothed with rather long white subrecumbent hairs ....	1 <b>ingens</b>
Abdomen with short sparse setæ .....	2 <b>striata</b>
Elytral callus not prominent; body oval, the prothorax strongly narrowed from the base .....	3 <b>umbilicata</b>
6—Body extremely densely punctured throughout .....	4 <b>arizonica</b>
7—Small species, dark red-brown in color, the elytra still paler; elytral setæ almost scale-like, recurved .....	5 <b>hispidula</b>
Much larger species, black throughout; elytral setæ slender and bristle-like. Body very robust, oblong; elytral intervals all much wider than the grooves, the punctures broadly confused but forming nearly even single lines on the first, fifth and seventh, smaller than in <i>strenua</i> and not so coalescent .....	6 <b>gravida</b>

- Body less robust and more oval ; elytral intervals all narrow and with single anastomosing series, except the second and third, which are wider and with the punctures confused.....7 **strenua**
- 8—Pronotal punctures very coarse, somewhat irregular and nearly as large as the scutellum ; second and third elytral intervals much wider than the others ; interstitial punctures small .....8 **callida**
- 9—Prothorax large, always distinctly more than one-half as long as the elytra, the median line—viewed in profile—more strongly declivous toward apex ; beak generally extremely short.....10
- Prothorax shorter, not more than one-half as long as the elytra, the median line in profile evenly, feebly arcuate and not more strongly declivous toward apex ; beak variable in length but generally longer.....17
- 10—Pronotal punctures sparse, sometimes very remote.....11
- Pronotal punctures close-set and even, never separated by more than their own diameters at any part of the disk ; interstitial punctures generally large and more or less approximate .....14
- 11—Interstitial punctures of the elytra fine.....12
- Interstitial punctures coarse, rounded ; pronotal punctures often smaller and closer anteriorly but always sparse toward base ; prosternum distinctly impressed .....13
- 12—Legs black or piceous-black.
- Integuments dull but smooth ; large species, intense black, the body almost evenly oval, strongly convex .....9 **subovalis**
- Integuments highly polished and with a more or less pronounced æneous lustre ; species moderate in size.
- Beak in the female two-thirds as long as the prothorax .....10 **lubrica**
- Beak in the female not more than one-half as long as the prothorax.
- 11 **tumescens**
- Legs red, the tarsi black ; pronotal punctures extremely sparse, large and rather feebly impressed .....12 **nitida**
- 13—Black, the prothorax shorter, strongly transverse in the female ; prosternum deeply impressed .....13 **soluta**
- Piceous ; body more narrowly oval, the prothorax longer and more rounded at apex ; elytral setæ longer, semi-erect and conspicuous ; beak in the male not more than one-half as long as the prothorax.....14 **floridensis**
- 14—Interstitial punctures generally broadly confused at least on the alternate intervals, although often forming even series on some of the intervals .....15
- Interstitial punctures generally forming single series, although sometimes confused on the third and frequently, also, on others very near the base...16
- 15—Prothorax about as long as wide ; all the elytral intervals coarsely, confusedly and somewhat rugosely punctured.....15 **subænea**
- Prothorax wider than long.
- Color dark piceous-brown throughout ; smaller species, the surface polished, the elytral setæ robust and subsquamiform, arranged without order and very conspicuous though not dense .....16 **vespertina**



Color black; lustre more or less dull; elytral setæ more hair-like, less broadly scattered over the intervals and less conspicuous.

Legs black or piceous-black.

Smaller and narrower species, the integuments dull and opaque, the punctures smaller.....17 **oblongula**

Larger species, robust and oblong, subparallel; lustre very feebly alutaceous, the elytra quite polished; interstitial punctures coarser and more transverse.....18 **transversa**

Legs bright red; larger species, strongly convex, coarsely punctate, the pronotum usually distinctly alutaceous.....19 **dilatata**

**16**—Elytra strongly narrowed behind the humeri; small species, the integuments polished and with a distinct piceous tinge.....20 **cuneipennis**  
Elytra subparallel or very feebly narrowed behind the humeri.

Interstitial punctures broadly confused on the third, and sometimes also on the second, interval, these being then wider than the others; rather small species, dark piceous-brown throughout.....21 **aprica**

Interstitial punctures forming an approximately even single series on all of the intervals.

Smaller species, piceous to piceous-black in color, the prothorax more strongly rounded on the sides anteriorly; legs somewhat finely punctate.....22 **dolosa**

Larger and more elongate-oval, intense black, highly polished, the prothorax shorter and more conical, the pronotum not so declivous anteriorly; legs coarsely punctate.....23 **zuniana**

**17**—Dull, finely and extremely densely punctate; interstitial punctures broadly confused at least on the alternate intervals; elytral striæ not very deep, distinctly punctate at the bottom.....18

Strongly shining; sculpture variable .....19

**18**—Body less stout, the beak rather slender and fully three-fourths as long as the prothorax in the female. California.....24 **opacula**

Body and beak moderately robust, the latter not more than two-thirds as long as the prothorax in the female; punctures slightly larger; elytral lustre less densely opaque. Nebraska.....25 **porosicollis**

**19**—Abdomen extremely densely and rugosely punctured throughout the width; pronotal punctures coarse and sparse, the interstitial punctures of the elytra moderate; beak rather long.....26 **punctiventris**

Abdomen not so densely or rugosely punctate, at least toward the middle...20

**20**—Interstitial punctures of the elytra larger, always exceeding in diameter one-third of the width of the narrower intervals, at least toward base...21

Interstitial punctures small, never exceeding in diameter one-third the width of the narrower intervals; æneous metallic lustre predominant.....24

**21**—Legs red or distinctly rufo-piceous throughout. California.....22

Legs black, or at most with a slight piceous tinge.....23

**22**—Pronotal punctures somewhat coarse, deep and very dense, with a rather conspicuous impunctate line; interstitial punctures large, deep and approximate; body black, the elytra more or less rufo-piceous in color; beak unusually long, nearly as long as the prothorax in the female.

27 **rubripes**

Pronotal punctures decidedly coarse, deep and sparser, the impunctate line almost obsolete; punctures of the intervals coarse but extremely feeble and rather remote; body piceous in color, the elytra pale rufo-castaneous.

28 **sparsa**

Pronotal punctures very fine, without trace of median impunctate line; large species.....29 **brunneipes**

**23**—Sides of the prothorax strongly convergent from the base and with a broad sinuation in more than basal half; beak unusually long and strongly arcuate.....30 **deformis**

Sides of the prothorax subparallel or very feebly convergent, without distinct sinuation.

Pronotum usually densely punctate, the punctures deep and often almost in mutual contact throughout, without trace of impunctate line except in *futilis*, where it is very variable and sometimes conspicuous.

Legs intense black throughout and rather strongly and closely punctured; body somewhat robust.....31 **futilis**

Legs piceous-black, the knees feebly rufescent; body decidedly slender, the beak rather slender, strongly arcuate and about four-fifths as long as the prothorax in the female.....32 **inconspicua**

Pronotum less densely punctate and with a narrow, moderately definite impunctate line, which, however, occasionally becomes obliterated; sides of the prothorax almost evenly rounded from base to apex.

Integuments with strong æneous metallic lustre.

Smaller species, about 3 mm. in length.....33 **confinis**

Larger species, 4 mm. in length, more robust; beak a little shorter and stouter.....34 **subsimilis**

Integuments intense black, without trace of æneous lustre; prothorax more elongate, the pronotal punctures usually sparser....35 **socialis**

**24**—Pronotum generally densely punctate.....25

Pronotum more sparsely punctate.....26

**25**—Elytral striæ coarse, at least nearly one-half as wide as the intervals.

Body narrowly oval; sides of the prothorax convergent from the base and strongly, almost evenly arcuate .....36 **aperta**

Body broad, oblong, the prothorax much more transverse; sides abruptly rounded and convergent anteriorly; lustre strongly æneous.

37 **abrupta**

Elytral striæ very fine, much less than one-half as wide as the intervals.

Striæ finely but remotely crenulate, the intervals often feebly alutaceous in lustre; large species, the body moderately stout, parallel.

38 **tenuestriata**

Striæ totally impunctate and without trace of crenulation; body small and slender .....39 **macra**

**26**—Form narrow, the prothorax but slightly wider than long.

40 **discipula**

Form more broadly ovate, the prothorax more or less strongly transverse.

Lustre strongly æneous.

Beak very short, scarcely two-thirds as long as the prothorax...41 **ærea**

Beak longer.

Base of the prothorax distinctly less than three times as wide as the head; minute species, with very fine elytral striæ...42 **scintillans**

Base of the prothorax three times as wide as the head or nearly so; much larger species, the elytral striæ coarse.

Prothorax short and transverse, subequal in width to the elytra, the sides subparallel and strongly arcuate .....43 **æneomicans**

Prothorax longer, the sides convergent and nearly straight from the base.

Pronotal punctures moderately coarse, separated by about their own diameters; body black throughout, but with strong æneous lustre .....44 **hyperion**

Pronotal punctures much coarser and separated by about twice their own diameters; elytra rufo-piceous .....45 **vitrea**

Lustre highly polished but not æneous.

Legs black; body elongate-oval, black, with a feeble bluish metallic lustre .....46 **ancilla**

Legs piceous or rufo-piceous.

Larger species, the interstitial punctures of elytra exceedingly minute.

47 **splendens**

Very small species, the interstitial punctures small but deep and distinct; apex of the prothorax rounded almost evenly and continuously with the sides .....48 **exigua**

The sculpture in *Baris* varies to an extreme degree, and I have before me specimens of *transversa* with the interstitial punctures varying between wide limits, confused on all the intervals or forming even series. I have been forced, however, to refer extensively to sculpture in separating and describing the species, since this is one of those enormously difficult genera containing a large number of undoubtedly distinct species—as shown by extended series,—which can only be distinguished by bodily facies, and which are devoid of prominent structural differences, but the language employed should not be interpreted too rigidly, as it applies in general only to the typical forms of a species. For example, the pronotal punctuation in *futilis* and *inconspicua* is said in the table to be dense, but there are specimens of both these species before me, in which the punctures become separated by fully their own width, or what might be termed sparse. In the case of isolated specimens, therefore, a search for the proper identification in the table must be more or less tentative, and it is quite possible that the table itself may be misleading in those cases where I have had to take the characters from single specimens. It has been my constant care to avoid synonymical repetitions, and, except in obvious cases, I have

only accepted those species which could be demonstrated by large series. The fact that nearly four hundred specimens have been studied in composing the table, increases my belief that the number of species at least has not been materially overestimated.

Baris as here considered also occurs abundantly in Brazil, and the species taken on the banks of the Amazon and La Plata cannot be distinguished in type from our own representatives. The genus, even in its restricted sense, is therefore a very large one. The European species have a distinctly different facies and should be revised from the generic point of view; the species are surely too heterogeneous to be included in a single genus.

1 **Baris ingens** n. sp.—Oval, rather strongly convex, intense black throughout, the integuments strongly shining. *Head* finely, sparsely punctate, with a deep frontal fovea, the impression very feeble; beak stout, evenly and distinctly arcuate, coarsely strongly but not very densely punctate, three-fourths as long as the prothorax, the setæ long and bristling beneath; antennæ rather long, the funicular joints less coarctate than usual, broad but obconical near the club, the latter large, robust, the basal joint distinctly less than one-half of the mass, transverse. *Prothorax* small, very nearly as long as wide, the sides in basal two-thirds rather strongly convergent and nearly straight, then broadly rounded, thence more convergent and slightly constricted to the apex, which is scarcely two-fifths as wide as the base, the latter transverse, the median lobe broad and strong; disk with a very uneven and ill-defined median line, the punctures very coarse and deep, abruptly perforate, one-half as wide as the scutellum and generally separated by less than one-half of their own diameters, each bearing a conspicuous fine cinereous seta. *Scutellum* moderate, transverse, not strongly impressed. *Elytra* large, one-third longer than wide, nearly two and one-half times as long as the prothorax, and, at the large and longitudinally but not laterally prominent humeri, rather abruptly almost one-third wider than the base of the latter; sides parallel and nearly straight in basal two-thirds, then gradually rounded to the apex, which is somewhat parabolic; disk with coarse, deep, strongly and not very remotely punctured grooves; intervals flat, one-half wider than the grooves, each with a single uneven series of moderately large, deep, close-set punctures, the setæ moderate in length, slender, conspicuous. *Abdomen* rather sparsely punctate, each puncture bearing a long cinereous and conspicuous setiform hair, giving a strongly pruinose appearance by unaided vision. *Anterior coxæ* approximate, separated by scarcely one-fifth of their own width; prosternum not impressed. Length 7.3 mm.; width 3.5 mm.

#### Arizona.

A conspicuously distinct species, easily recognizable by its large size, small prothorax, ample elytra and unusually evident but slender setæ, especially pronounced on the abdomen. The type is a



male and has a large although moderately deep, oval impression, occupying the basal half of the abdomen. The transverse groove immediately before each posterior coxa is very wide, extremely deep, cavernous and abruptly limited anteriorly the metasternum thence to the middle coxæ decidedly tumid.

*Ingens* is more closely related to *striata* than to any other of our species, the differences being expressed in the table.

2 **Baris striata** Say.—Curc. 17, Ed. Lec., I, p. 281 (Baridius).

This is a rather common species of extended distribution, occurring throughout the Mississippi and Missouri valleys, but not, to my knowledge, extending to the Atlantic coast regions. The beak is robust, strongly arcuate and quite distinctly shorter than the prothorax, the latter relatively smaller than usual, fully one-third wider than long, with the sides feebly convergent to apical fourth, then strongly rounded and convergent to the apex, behind which there is generally a feeble constriction; the punctures are very coarse and generally separated by scarcely one-half of their own widths. Scutellum transverse and broadly impressed. Elytra large, a little more than twice as long as the prothorax and abruptly nearly one-fourth wider than that part, the humeral tuberosities small but very distinct; the striæ are very coarse, deep and punctate and the intervals are but slightly wider than the grooves, each with a single uneven series of moderately coarse, very deep, close-set punctures, the setæ moderate in length, erect and distinct but not as conspicuous as in *strenua*.

The prosternum is not impressed in front of the coxæ, and the latter are somewhat closer than in any other species which I have observed, being separated by rather less than one-fifth of their width. Length 4.8–5.5 mm.; width 2.25–2.7 mm.

The series before me is from Arkansas, Wisconsin and Montana.

3 **Baris umbilicata** Lec.—Proc. Ac. Nat. Sci., Phila., 1868, p. 363 (Baridius); Proc. Am. Phil. Soc., XV, p. 291.

Of this well-marked species I have before me a series of between twenty and thirty specimens, showing great variation in size, and also in certain other more unexpected directions. The body is deep polished black throughout, robust and very strongly convex. The beak is rather long and but feebly arcuate, three-fourths as long as the prothorax in the male, and but very slightly shorter than the

latter in the female. Prothorax subconical, more strongly narrowed near the apex, convex, coarsely but not very densely punctate, the punctures circular, about one-half as wide as the transverse scutellum, and separated by their own diameters in some specimens, to scarcely one-half that distance in others. Elytra large, fully twice as long as the prothorax and nearly one-fourth wider than the latter, the grooves exceedingly wide and deep, distinctly and remotely punctate at the bottom, the intervals not at all wider than the grooves, each with a single series of rather coarse very deep and distant punctures, the second and third not wider, the setæ very small, visible, but not in the least conspicuous. Abdomen coarsely deeply and closely punctured.

The male has the abdomen narrowly and deeply impressed nearly through the length of the two basal segments, but in a small specimen from Florida this impression is very small, feeble and situated near the base. Length 3.2–4.8 mm ; width 1.5–2.4 mm.

New York (Long Island), Pennsylvania, District of Columbia, Florida, Texas, Iowa and Colorado (Denver).

4 **Baris arizonica** n. sp.—Oblong, rather robust, moderately convex, piceous-black, the legs and elytra slightly paler ; lustre somewhat dull from the density of punctuation, the interspaces polished. *Head* very minutely punctured, separated from the beak by an impression which is unusually feeble ; beak long, not very stout, feebly arcuate, nearly as long as the prothorax, finely but strongly, sparsely punctured, very densely so laterally toward base ; antennæ moderate, the club very large, stout, ovoidal, with its basal joint in great part pubescent and only feebly shining toward base, basal joint of the funicle shorter than the next three. *Prothorax* rather short, nearly two-fifths wider than long, the sides parallel and broadly arcuate in basal three-fourths, then rather abruptly but not angularly rounded, thence strongly convergent and distinctly sinuate to the apex ; base not quite three times as wide as the head, broadly and evenly bisinuate ; disk with a very short narrow median impunctate spot, the punctures rather coarse, very deep and extremely dense, two-fifths as wide as the scutellum and almost in mutual contact even toward the middle. Scutellum short, unusually transverse, broadly, deeply impressed in the middle. *Elytra* one-fourth longer than wide, slightly more than twice as long as the prothorax, and, at the feebly tumid humeri, about one-fifth wider than the latter, very broadly, obtusely rounded behind ; disk with coarse but rather shallow, distinctly and transversely punctate grooves, the intervals wide, flat, the second and third much wider than the others, and all densely, confusedly, strongly but not very coarsely punctured ; setæ very short, not conspicuous. *Abdomen* rather finely but strongly, not very densely punctured. *Legs* short, finely, rather feebly, not densely punctate, the outer line of the tibiæ sinuous, the apex prominent ; tarsi pale rufous, the claws rather long. Length 4.0 mm. ; width 1.95 mm.

## Arizona.

This species, although much smaller, is related to *striata*. It will be readily known by its very dense punctuation, short prothorax and unusually long beak; it is represented by a single female specimen.

5 **Baris hispidula** n. sp.—Oval, strongly convex, shining, castaneous-brown, the elytra paler red-brown. *Head* with a small frontal fovea, finely but deeply punctured anteriorly, becoming minutely and sparsely so posteriorly, the transverse impression separating it from the beak unusually feeble; beak feebly arcuate toward base, straight in apical two-thirds, four-fifths as long as the prothorax, coarsely, deeply, moderately closely punctate; antennæ moderate, club rather short and stout, acutely conoidal, its basal joint constituting rather more than one-half the mass and pubescent in apical half. *Prothorax* elongate, just visibly wider than long, the sides almost evenly arcuate throughout, gradually becoming parallel near the base; apex broadly, feebly arcuate, one-half as wide as the base, the latter not quite three times as wide as the head, transverse, the median lobe unusually wide but feeble; disk with a moderately wide but not entire impunctate line, the punctures moderately coarse, deep, somewhat elongated, separated by about their own widths but tending to form longitudinal rugæ toward base. Scutellum moderate, transverse, broadly impressed. *Elytra* scarcely more than one-fifth longer than wide, two-thirds longer than the prothorax, and, at the moderately tumid humeri, abruptly nearly one-fourth wider than the latter; sides parallel in basal two-thirds, then gradually convergent, the apex semi-circularly rounded; disk with coarse, deep, abrupt, rather strongly but not closely punctured grooves, the intervals but very slightly wider than the grooves, each with a single series of coarse, very deep, rather close-set punctures; setæ semi-erect, rather long, broad, subsquamiform, conspicuous. *Abdomen* rather sparsely but strongly punctate, each puncture bearing a short but robust, pale, subsquamiform seta. Anterior coxæ large, globose, rather approximate, separated by one-fourth of their own width. Length 3.9 mm.; width 1.8 mm.

Colorado. Mr. Jülich.

The type is a male, and has the abdomen rather narrowly and distinctly impressed in the middle toward base. The peculiar pale coloration may, in part at least, be due to immaturity, but the species is remarkably distinct in the coarse and squamiform nature of the short and normally sparse setæ, these, as usual in the present group, also bristling conspicuously from the lower surface of the rostrum.

6 **Baris grvida** n. sp.—Oblong, strongly convex, robust, black, polished, the setæ rather small, semi-erect and moderately conspicuous on the elytra. *Head* obsoletely punctate, the transverse impression distinct, broadly

angulate viewed in profile, and with a large elongate median fovea; beak very short and robust, coarsely, deeply punctate, feebly arcuate, scarcely three-fifths as long as the prothorax; antennæ moderate, the club but slightly longer than wide. *Prothorax* large, one-fifth wider than long, the sides slightly convergent and nearly straight to apical fifth, then very abruptly rounded, thence extremely convergent and straight to the apex, which is much less than one-half as wide as the base, the latter transverse, the median lobe nearly one-third of the total width, rounded; disk with a narrow prominent median line, the punctures moderately coarse, deep and decidedly dense, one-third as wide as the scutellum and almost in mutual contact, uneven in shape. Scutellum transverse, broadly, deeply impressed. *Elytra* a little wider than the prothorax and about two-thirds longer, but very little longer than wide, parallel, very obtusely rounded behind; humeral callus small and feeble; disk with very coarse deep grooves, finely punctate at the bottom, the intervals alternating in width, all much wider than the grooves, the punctures coarse, close-set, broadly confused on all except the first, fifth and seventh, where they form tolerably even single lines. *Abdomen* strongly punctate and setose. Prosternum perfectly flat, separating the coxæ by barely one-fourth of their own width, the punctures dense and only moderately coarse. Length 6.0 mm.; width 3.1 mm.

Texas (Big Springs). Mr. H. F. Wickham.

The single representative is a female and the species is allied to *strenua*, differing however in many strongly marked features, among which should be mentioned the much more obese form, smaller, denser punctures, broadly confused on most of the elytral intervals, the more prominent and subcariniform median line of the pronotum and the relatively shorter beak.

7 **Baris strenua** Lec.—Proc. Ac. Nat. Sci., Phila., 1868, p. 363 (Bari-dius); Proc. Am. Phil. Soc., XV, p. 291.

The general form of this species, which is one of the largest of the genus, is oblong-oval, robust and strongly convex, the surface polished, black and deeply sculptured. The beak is short, moderately stout and arcuate, and is scarcely two-thirds as long as the prothorax in the female. The prothorax is but slightly wider than long, with the sides distinctly convergent and almost straight nearly to apical fifth, then strongly rounded, thence very strongly convergent to the apex which is somewhat tubulate, the disk has a more or less ill-defined abbreviated impunctate line, the punctures being rather large, deep and separated by slightly less than their own diameters. Scutellum strongly transverse, broadly, deeply impressed, prominent posteriorly at the sides. Elytra abruptly about one-fifth wider than the prothorax, one-fifth longer than wide and



a little less than twice as long as the prothorax, the grooves very wide and deep, the intervals but slightly wider than the grooves, very coarsely deeply and approximately punctate, the punctures contiguous and generally more or less confused toward base. Setæ cinereous, long, erect and very conspicuous but not squamiform. Length 4.5–5.8 mm.; width 2.1–2.8 mm.

Arizona, Texas, Kansas and Montana. The series before me consists of fourteen specimens. In one the thoracic punctures are larger than usual and somewhat longitudinally subcoalescent. The prosternum is generally perfectly flat, but in two or three examples not otherwise materially differing, it becomes more or less distinctly impressed along the middle.

8 **Baris callida** n. sp.—Oblong-oval, strongly convex, deep black throughout, polished. *Head* minutely, sparsely, the beak strongly punctured, the latter densely rugulose at the sides, feebly arcuate, moderately stout, scarcely two-thirds as long as the prothorax; antennæ moderate, the club rather small, with the basal joint much less than one-half of its total length, highly polished. *Prothorax* nearly two-fifths wider than long; sides feebly convergent in basal two-thirds, then rather strongly rounded, thence moderately strongly convergent and nearly straight to the apex; base about three times as wide as the head, subtransverse, the median lobe moderate in size and prominence; disk with an ill-defined central impunctate spot, the punctures very large, deep, uneven in shape and distribution but rather dense, nearly as large as the scutellum and as a rule separated by scarcely one-half of their own dimensions. Scutellum rather small. *Elytra* one-fourth longer than wide, about twice as long as the prothorax, and, at the large though moderately tumid humeri, fully one-fourth wider than the latter; sides subparallel, the apex almost semi-circularly rounded; disk with coarse deep finely and remotely punctate grooves, the intervals flat or very feebly convex, but slightly wider than the grooves, each with a single series of small but deep, moderately distant punctures, the second and third wider and with the punctures broadly confused, the third nearly twice as wide as the grooves; setæ very minute and inconspicuous. *Abdomen* very sparsely punctate, the punctures fine but becoming coarse toward the sides. *Legs* rather short and robust, polished, sparsely but somewhat strongly punctured. Length 4.0 mm.; width 2.0 mm.

Georgia.

The unique type is a male, and has the abdomen broadly and feebly impressed in the middle toward base. It somewhat resembles *umbilicata*, but has the pronotal punctures denser and more uneven, the second and third elytral intervals wide with the punctures broadly confused, and the punctuation of the abdomen fine and very sparse; it also differs in its decidedly shorter beak and

form of the scutellum. The prosternum is not distinctly impressed, and the coxæ are separated by slightly more than one-fourth of their own width.

9 **Baris subovalis** Lec.—Proc. Ac. Nat. Sci., Phila., 1868, p. 363 (Bari-dius); Proc. Am. Phil. Soc., XV, p. 291.

A large and remarkably isolated species, represented by the original type, which is apparently still unique. The form is almost evenly oval, very convex, intense black throughout, the integuments very dull but smooth and minutely, strongly granulo-reticulate. The beak in the female is thick, distinctly and evenly arcuate, strongly punctured and about three-fourths as long as the prothorax, the latter large, one-third wider than long, the sides distinctly convergent and nearly straight to apical fourth, then rounded and more convergent to the apex, the base straight and unusually oblique from the middle, the lobe very small, the disk with an ill-defined median impunctate line which does not attain the apex, the punctures not very coarse but deep and separated by rather more than their own widths. Elytra coarsely and deeply grooved, the intervals flat, about one-half wider than the grooves, each with a somewhat uneven series of small but deep, moderately close-set punctures, broadly confused on the third and fifth, the setæ very minute and inconspicuous. Prosternum narrowly and feebly impressed, the coxæ separated by distinctly less than one-half of their own width, the sides of the process strongly convergent. Length 5.8 mm.; width 2.9 mm.

Wisconsin. Cab. LeConte. There is no other species known to me which at all approaches *subovalis* in general habitus.

10 **Baris lubrica** n. sp.—Oblong-oval, strongly convex, black throughout, highly polished, the lustre quite distinctly æneous. Head obsoletely punctured, the beak finely, strongly, sparsely so, feebly arcuate, robust, two-thirds as long as the prothorax, the basal transverse impression unusually feeble; antennæ moderate, the club rather small. Prothorax large, scarcely one-third wider than long; sides feebly convergent and very slightly arcuate to apical fourth, then strongly rounded, thence strongly convergent and nearly straight for a short distance to the apex, which is transversely truncate; base three and one-half times as wide as the head, straight and feebly oblique from the rather wide broadly and feebly rounded median lobe to the sides; disk with a wide but very ill defined elongate impunctate spot, the punctures moderately coarse, sparse, somewhat deep, impressed, minutely umbilicate, about one-third as wide as the scutellum and separated by nearly three times their own diameters. Scutellum somewhat large, subquadrate, slightly trans-

verse. *Elytra* scarcely more than one-fourth longer than wide, a little less than twice as long as the prothorax, and, at the small and feebly tumid humeri, but slightly wider than the latter; sides behind the humeri very feebly convergent, the apex broadly, almost semi-circularly rounded; disk with moderately coarse, very deep, abrupt, finely remotely and very feebly crenulate grooves, the intervals at least twice as wide as the grooves, flat, each with a series of small, moderately distant, somewhat transversely rugulose punctures, which are more or less confused on the second, third and fifth; setæ small but distinct, silvery. *Abdomen* finely, feebly, sparsely punctured, the setæ of the under surface quite robust, pale and distinct. *Legs* very short, robust, black, finely and sparsely punctured; claws moderate. Length 3.7-4.5 mm.; width 1.9-2.3 mm.

Florida. National Museum.

The type is a female judging by the entirely unimpressed abdomen, but in several of the species allied to this in general habitus, the male sexual characters become very feeble, so that it is occasionally difficult to determine the sex of isolated individuals. The present species is widely distinct although somewhat allied to *nitida*; it may be known, however, by its black legs, finer pronotal punctures, less rhomboidal form of the body, larger scutellum, closer and more transversely rugulose interstitial punctures, and more evident setæ. The anterior coxæ are separated by one-half of their own width.

11 ***Baris tumescens*** Lec.—Proc. Ac. Nat. Sci., Phila., 1868, p. 362 (Baridius); Proc. Am. Phil. Soc., XV, p. 292.

Oblong, robust, convex, black throughout, the legs somewhat piceous, polished and feebly æneous, the beak very short, not at all over one-half as long as the prothorax in the female, the prothorax large, one-fourth wider than long, subparallel, strongly rounded and extremely convergent near the apex, the base fully three and one-half times as wide as the head, the disk without median line, the punctures rather coarse and impressed, separated by twice their own diameters. The elytra are but slightly longer than wide and two-thirds longer than the prothorax, coarsely, deeply striate, the grooves distinctly crenulate, becoming deeply and conspicuously so toward base; intervals flat or feebly convex, scarcely one-half wider than the grooves, each with a single series of rather small but deep, moderately distant punctures, the third very much wider than any of the others and with the punctures sparse but confused. Length 4.3 mm.; width 2.2 mm.

Middle States—LeConte; Nebraska.

12 **Baris nitida** Lec.—Proc. Am. Phil. Soc., XV, p. 292.

A species of medium size and distinct facies, of rather robust, very convex and subrhomboidal form and polished, feebly æneous lustre. Prothorax not quite as elongate as in some of the allied forms, from one-third to two-fifths wider than long, the sides feebly convergent to apical fourth, then strongly convergent and straight or feebly sinuous to the apex, coarsely, very sparsely punctate, the punctures not very deep, impressed and umbilicate. Scutellum very small, nearly circular. The humeri are unusually prominent, and the elytra rather strongly convergent behind them, the striæ moderate in width, deep, the intervals about twice as wide as the striæ, each with a single series of small but rather deep, remote punctures, not confused on the second or third, the setæ very small and not at all conspicuous. The legs are red and the tarsi piceous. Length 3.9–4.4 mm.; width 2.1–2.3 mm.

Florida (Biscayne Bay). I have seen but two specimens; one, the original type, in the cabinet of LeConte, and the other, entirely similar, kindly given me by Mr. W. Jülich of New York.

13 **Baris soluta** n. sp.—Oblong, robust, convex, black and highly polished throughout; setæ very minute and inconspicuous. Head minutely and very remotely punctulate, the transverse impression strong and angulate; beak exceedingly short and thick, finely, not densely punctate, arcuate, gradually flattened toward apex, barely three-fifths as long as the prothorax; antennæ moderate, the club small, compressed, on the narrow side scarcely at all wider than the seventh funicular joint. Prothorax transverse, fully one-half wider than long, the sides rounded and feebly convergent to apical fourth, then strongly rounded to the apex; base oblique and straight from the very small and feeble median lobe to the obtuse basal angles; disk coarsely and sparsely punctate, the punctures one-half as wide as the scutellum and separated by nearly twice their own diameters, finer and closer toward apex; impunctate line feebly evident. Scutellum moderate, subquadrate. Elytra not wider and fully four-fifths longer than the prothorax, the sides feebly convergent, the apex obtusely rounded; humeri rather prominent; striæ very coarse and deep, not distinctly crenulate toward base; intervals but slightly wider than the grooves, each with a single series of moderately large deep and somewhat close-set punctures, the second and third a little wider, the latter with the series slightly uneven. Abdomen coarsely, strongly but not very densely punctate. Prosternum very deeply impressed, almost sulcate, along the middle, separating the coxæ by two-thirds of their own width. Length 4.0–4.3 mm.; width 2.0–2.2 mm.

Louisiana; Arkansas; Colorado.

The type is a female; this sex seems to be invariably much



broadier than the male and with a relatively more transverse prothorax.

14 **Baris floridensis** n. sp.—Oblong-oval, convex, polished throughout, dark piceous-brown, the pronotum blackish. *Head* and beak sparsely punctured, the latter extremely short, thick, moderately arcuate, one-half as long as the prothorax; antennæ normal, the club robust, with its basal joint polished. *Prothorax* large, scarcely more than one-fifth wider than long; sides subparallel in about basal half, then broadly, evenly rounded to the apex, which is narrowly transverse and truncate; base three times as wide as the head, straight and very feebly oblique from the moderately wide and rounded median lobe to the sides; disk strongly convex anteriorly and laterally, without trace of median line, the punctures rather coarse, deep, well separated, subperforate with the edges slightly obtuse, two-thirds as wide as the scutellum and separated by nearly their own widths, becoming slightly smaller and closer toward apex. Scutellum well developed, not impressed, slightly transverse. *Elytra* scarcely more than one-fourth longer than wide, three-fourths longer than the prothorax, and, at the rather small and moderately tumid humeri, slightly wider than the latter; sides behind the humeri distinctly convergent and nearly straight, broadly rounded at apex; disk with moderately coarse, very deep, abrupt, finely, remotely but distinctly punctate grooves; intervals scarcely twice as wide as the grooves, flat, each with a single series of large shallow moderately close-set punctures, the second distinctly wider and with the punctures smaller closer and broadly confused; setæ very small but forming quite visible series by anteriorly oblique illumination. *Abdomen* rather coarsely but sparsely and shallowly punctured. *Legs* moderate, sparsely but rather strongly punctate. Length 4.0 mm.; width 1.8 mm.

#### Florida.

The single male serving as the type represents a species quite closely allied to *soluta*, but differing in its slightly narrower form, shorter beak, less coarse pronotal punctures and several other characters. The abdomen is rather narrowly and very feebly impressed in the middle toward base; the prosternum nearly flat, very widely separating the coxæ. *Floridensis* may be distinguished from *transversa* by its much sparser punctuation, narrower form, piceous elytra and longer elytral setæ.

15 **Baris subænea** Lec.—Proc. Ac. Nat. Sci., Phila., 1868, p. 361 (Bari-dius); Proc. Am. Phil. Soc., XV, p. 292.

A moderately large but somewhat narrow, strongly convex species, with coarse deep rugulose sculpture and somewhat piceous color. The beak in the male is moderately robust, feebly arcuate and about three-fifths as long as the prothorax, the latter rather

more elongate than in any of our other species, scarcely perceptibly wider than long, with the sides distinctly convergent and nearly straight from the base to between apical third and fourth, then strongly rounded, then somewhat strongly convergent and nearly straight to the apex; base about three times as wide as the head, the median lobe pronounced; disk with a narrow ill-defined median line, the punctures coarse, very deep and rather dense, somewhat uneven in size. Elytra not very coarsely but deeply and abruptly grooved, the intervals about twice as wide as the grooves, and all coarsely, closely, confusedly punctured throughout their extent, and coarsely rugose but polished, the second and third less coarsely, more sparsely punctured and smoother. Length 4.5 mm.; width 2.0 mm.

Middle States.

16 **Baris vespertina** n. sp.—Oblong-oval, convex, polished and dark piceous-brown throughout, the setæ long, stout, acuminate, strigose, sparse but conspicuous, semi-erect and arranged without order on the elytra. Head minutely but distinctly, not very remotely punctured, the beak not coarsely but deeply, densely so, rugose at the sides, robust, moderately arcuate and about three-fourths as long as the prothorax; antennæ inserted distinctly behind the middle, the scape very short, club moderate, its basal joint polished, pubescent toward apex. Prothorax one-half wider than long, the sides just visibly convergent, evenly and distinctly arcuate to near the apex, then gradually more strongly arcuate, convergent and feebly sinuate to the apex, which is broadly arcuate and fully one-half as wide as the base, the latter but slightly oblique, the median lobe small but prominent; disk coarsely deeply and very densely punctate, the punctures two-thirds as wide as the scutellum and almost in mutual contact; median impunctate line narrow, not attaining the apex. Scutellum moderate, quadrate, not impressed but somewhat rugose. Elytra slightly wider and nearly four-fifths longer than the prothorax; sides behind the feebly prominent humeri slightly convergent, the apex abruptly and obtusely rounded; striæ moderately deep, not very coarse, the intervals flat, nearly twice as wide as the grooves, the punctures moderately coarse, not very dense but rugose and confused on all the intervals, the second and third a little wider. Abdomen strongly, rather coarsely, somewhat closely punctured. Prosternum broadly and just visibly impressed, separating the coxæ by one-half of their own width. Length 3.3–3.5 mm.; width 1.6–1.7 mm.

Arizona.

The form of the prothorax, with the pronotum more declivous anteriorly, shows that this very distinct species should be associated with *transversa* and its allies. In the male the abdomen is broadly and feebly but distinctly impressed near the base.

**17 *Baris oblongula*** n. sp.—Dull and strongly alutaceous in lustre, oblong-oval, convex, deep black throughout, the legs slightly piceous. *Head* sparsely, minutely punctate, the beak more coarsely and closely so, densely rugose at the sides, short, thick, arcuate, but slightly more than one-half as long as the prothorax; antennæ moderately slender, the club rather small, not one-half as long as the funicle, the first joint of the latter shorter than the next three. *Prothorax* scarcely one-fourth wider than long; sides broadly, evenly arcuate, becoming nearly parallel toward base, the arcuation only slightly stronger near the apex; base three and one-half times as wide as the head, the median lobe rather narrow, distinct; disk somewhat coarsely, deeply and very densely punctate, the punctures one-half as wide as the scutellum and separated by rather less than one-half their own diameters, with a narrow and distinct impunctate median line extending from the base nearly to the apex. *Scutellum* moderate, transverse. *Elytra* scarcely more than one-fourth longer than wide, three-fourths longer than the prothorax, at the feebly tumid humeri scarcely at all wider than the latter; sides feebly convergent and just visibly arcuate from the humeri, the apex abruptly, broadly rounded; disk with rather fine but deep and abrupt striæ, which are finely, very feebly punctate, the intervals each with a single row of rather large deep moderately distant punctures, somewhat confused on the second, third and fifth. *Abdomen* strongly, rather closely punctured. *Legs* somewhat sparsely and feebly punctate; tibiæ straight externally, the tarsal claws moderate. Length 3.8 mm.; width 1.8 mm.

Colorado.

The description is drawn from the male, the two basal segments of the abdomen being strongly impressed in the middle. The prosternum is feebly impressed and the coxæ separated by rather more than one-half of their own width. This species may be distinguished by the long, evenly rounded, strongly, densely punctate prothorax, which is subequal in width to the elytra, and by the very dull lustre of the entire upper surface. The pronotal punctures are denser, and, especially, smaller than in *transversa*, which *oblongula* somewhat resembles in form and size.

**18 *Baris transversa*** Say.—Curc. 18, Ed. Lec., I, p. 282 (Baridius); *interstitialis* Say: Journ. Acad. Nat. Sci., Phila., III, p. 314 (Rhynchænus); Curc. 18, Ed. Lec. I, p. 282 (Baridius); *quadrata* Lec.: Proc. Ac. Nat. Sci., Phila., 1868, p. 361 (Baridius); *carinulata* Lec.: Proc. Ac. Nat. Sci., Phila., 1858, p. 79 (Baridius); Proc. Am. Phil. Soc., XV, p. 292 (Baris).

Oblong, rather stout, parallel, convex, black, generally distinctly alutaceous in lustre, never in the least æneous; setæ sparse but quite distinct. Beak very thick, arcuate, punctate, scarcely one-half as long as the prothorax, nearly cylindrical. Prothorax large, rather more than one-third wider than long, the sides very feebly

convergent from the base to apical third, then abruptly rounded and rather prominent, thence very strongly convergent to the apex, the latter much less than one-half as wide as the base; disk very convex, coarsely, deeply punctate, the edges of the punctures obtuse; median impunctate line often obsolete but frequently distinct. Elytra about equal in width to the prothorax, the humeri slightly prominent; sides subparallel, the apex broadly obtuse; striae very coarse, deep; intervals alternately wide and rather narrow, the punctures coarse, close, subrugose, confused on the wider intervals. Prosternum broadly impressed along the middle, separating the coxæ by a little more than one-half of their own width. Length 3.5–4.8 mm.; width 1.8–2.3 mm.

New York, Indiana, Iowa, Missouri, Colorado and Texas. A widely distributed, common and easily recognizable species. I think that there is but little doubt that Say described *transversa* from one of the numerous sculptural modifications of *interstitialis*, but as the species is more commonly known under the name *transversa* and since the name "*interstitialis*" refers to a form which has never been accurately defined, and has always given rise to confusion and uncertainty, even on the part of Say himself, the course here pursued would appear to be for the best interests of science. *Carinulata* is not tenable as a species, the smooth median line of the pronotum being a most variable feature, as is also the interstitial punctuation.

19 ***Baris dilatata*** n. sp.—Oval to oblong-oval, robust, strongly convex, black, the beak rufescent toward apex, the legs bright rufous; integuments rather shining, without trace of æneous lustre. *Head* obsoletely, the beak moderately densely, deeply punctate, the latter short, robust, strongly arcuate toward base, less than one-half (♂) to nearly two-thirds (♀) as long as the prothorax; antennæ moderate. *Prothorax* large, convex, scarcely one-fourth wider than long; sides feebly convergent and just visibly arcuate to apical fourth, then rather strongly rounded but not very prominent, thence strongly convergent and straight or just visibly sinuate to the apex; base three and one-half times as wide as the head, transverse, straight, the median lobe rather wide and strongly developed, rounded; disk with narrow, more or less imperfect median line, the punctures deep, rather coarse, a little more than one-half as wide as the scutellum and generally separated by about their own widths. *Scutellum* moderate, often moderately impressed in the middle toward the posterior margin. *Elytra* one-fourth to one-third longer than wide, about two-thirds longer than the prothorax, and, at the moderately tumid humeri, quite distinctly wider than the latter; sides subparallel or very feebly convergent; apex broadly, rather abruptly rounded; disk with somewhat fine



but deep, abrupt, obsolete punctured grooves, the intervals two to three times as wide as the grooves, flat, moderately coarsely, deeply, rather closely punctate, the punctures more or less broadly confused on all, sometimes throughout but often only toward base; setæ very small, distinct but not conspicuous. *Abdomen* sparsely, somewhat finely punctate. *Legs* short, polished, very finely feebly and sparsely punctate; tibiæ straight, minutely prominent at apex. Prosternum scarcely at all impressed, the anterior coxæ distant, separated by but slightly less than their own width. Length 3.8–4.8 mm.; width 1.8–2.4 mm.

California (Lake and San Bernardino Cos.).

A moderately large, distinct and easily recognizable species, not at all closely allied to any other Californian representative of the genus, although having several near eastern relatives. It can always be distinguished from any of the latter by its bright rufous legs and short rufescent beak.

20 ***Baris cuneipennis*** n. sp.—Oblong-oval, convex, polished throughout, blackish-piceous, the pronotum rather darker than the elytra. *Head* almost impunctate, the beak moderately coarsely and closely so, robust, strongly arcuate, three-fourths as long as the prothorax; antennæ normal, the club rather small and not very abrupt, its basal joint glabrous and highly polished, the last joint of the funicle with a widely spaced crown of unusually long coarse bristles. *Prothorax* one-third wider than long; sides subparallel and almost straight in rather more than basal three-fourths, then strongly rounded, thence strongly convergent but not at all constricted to the apex, which is broadly, very feebly arcuate; base about two and two-thirds times as wide as the head, straight and feebly oblique from the small median lobe to the sides; disk with a narrow imperfect impunctate line, which in one example is finely striate toward the middle; punctures moderate in size, not very dense, somewhat uneven, from one-third to one-half as wide as the scutellum and separated by nearly their own diameters. Scutellum moderate, slightly transverse. *Elytra* about one-third longer than wide, relatively small, two-thirds longer than the prothorax, and, at the distinctly swollen humeri, slightly wider than the latter; sides behind the humeri quite distinctly convergent, the apex rounded; disk with moderately coarse and deep, abrupt, obsolete punctate grooves, the intervals flat or feebly convex, not very wide, each with a single series of coarse approximate punctures, the third interval noticeably wider than the others and with the punctures smaller and somewhat confused; setæ very minute, scarcely at all observable. *Abdomen* sparsely, moderately coarsely punctured. *Legs* moderate, finely, sparsely punctate; tibiæ straight; third tarsal joint not wider than long; claws moderate. Length 2.8–3.3 mm.; width 1.4–1.6 mm.

Texas (Austin).

The two specimens before me are apparently females. The prosternum is scarcely impressed and the coxæ separated by fully three-

fourths of their width, the process being unusually wide. The species is especially notable by reason of its coarsish punctuation, long prothorax and rather short subconical elytra.

21 **Baris aprica** n. sp.—Oblong-oval, strongly convex, polished and dark piceous-brown throughout, the setæ small, distinct but not conspicuous. *Head* excessively minutely and sparsely punctulate, the transverse impression strong and angulate; beak very short, thick, moderately arcuate, feebly flattened toward apex, densely but not coarsely punctate and about two-thirds as long as the prothorax; antennal scape very short, the club rather robust, oval, with the basal joint polished but sparsely pubescent and constituting a little less than one-half the mass. *Prothorax* one-third wider than long, the sides broadly rounded and strongly convergent anteriorly, becoming almost parallel and straight in basal two-thirds; base straight and feebly oblique at the sides, the lobe equalling nearly one-third of the width, rather prominent; disk coarsely deeply and densely punctate, the punctures very narrowly separated, a narrow impunctate line distinct but not attaining the apex. *Scutellum* moderate, subquadrate, rugose. *Elytra* but slightly wider and three-fourths longer than the prothorax, the sides behind the scarcely prominent humeri just visibly convergent; apex abruptly and obtusely rounded, the sutural notch broad and deep; striæ rather coarse, deep, the intervals but slightly wider than the grooves, each with a single series of large, very deep, even and almost contiguous punctures, the third much wider than the others and with the punctures broadly confused and smaller. *Abdomen* strongly but not coarsely, moderately closely punctured. *Prosternum* flat, densely punctate, separating the coxæ by rather more than one-half of their own width. Length 3.4–3.6 mm.; width 1.65–1.7 mm.

Arizona; Colorado.

The coarse deep rounded and close-set punctures, forming a single series on each of the elytral intervals, is a type of sculpture which forcibly reminds us of several species of *Onychobaris*, such as *stictica*, but otherwise there is no resemblance. *Aprica* belongs in the group containing *transversa*, but is not very closely related to any other species. The abdomen in the male has a rather small but distinct subbasal impression.

22 **Baris dolosa** n. sp.—Oblong-oval, strongly convex, piceous-black throughout, polished, the elytra frequently feebly piceous. *Head* obsoletely, the beak finely, sparsely punctured, the latter quite coarsely and closely so at the sides, thick and arcuate toward base, straight and somewhat tapering in apical half, two-thirds (♂) to three-fourths (♀) as long as the prothorax; antennæ moderate, normal. *Prothorax* nearly two-fifths wider than long, the sides nearly parallel and very feebly arcuate to apical fourth, then strongly but moderately narrowly rounded, thence very strongly convergent and nearly straight to the apex; base three times as wide as the head, subtransverse and

straight, the median lobe moderate in width but prominent, narrowly subtruncate at apex; disk with scarcely a trace of median line, coarsely, very deeply and closely punctate, the punctures one-half as wide as the scutellum or rather more, and separated by about their own diameters. Scutellum moderate, transverse. *Elytra* one-fifth longer than wide, two-thirds to three-fourths longer than the prothorax, and, at the moderately prominent humeri, but very slightly wider than the latter; sides subparallel, the apex broadly and abruptly rounded; disk with rather coarse, deep, obsoletely punctured grooves, the intervals scarcely one-half wider than the grooves, flat, each with a single series of coarse strong and very close-set punctures, sometimes slightly confused on the third; setæ small, semi-erect, cinereous and rather conspicuous. *Abdomen* finely, sparsely punctured. *Legs* moderate, finely, very sparsely punctate. Length 3.2–3.6 mm.; width 1.5–1.75 mm.

New York (Long Island); Pennsylvania; Indiana; Iowa.

A comparatively small, convex, strongly and deeply sculptured species bearing a general resemblance to *transversa*, but distinguishable by its much smaller size and the other characters given in the table. The anterior coxæ are widely separated and the prosternum feebly impressed. In the male the abdomen is narrowly and strongly impressed toward base. In the female the pronotal punctures are generally much closer, sometimes very dense, and the prothorax is frequently subprominent at apical fourth; the above described type is a male from Iowa.

23 **Baris zuniana** n. sp.—Oval, convex, highly polished and black throughout. *Head* minutely, sparsely punctate, the beak finely, deeply and sparsely so and not very densely at the sides, robust, short, arcuate, about three-fourths as long as the prothorax in both sexes; antennæ moderate, normal. *Prothorax* nearly two-fifths wider than long; sides convergent and broadly, almost evenly arcuate from base to apex, sometimes feebly sinuate for a short distance near the latter; base three times as wide as the head, straight and slightly oblique from the small and feeble median lobe to the sides; disk with or without a narrow, feebly defined impunctate line, the punctures rather coarse, deep, not very dense, two-thirds as wide as the scutellum and separated by nearly one-half their widths, somewhat uneven and noticeably smaller near the apex. Scutellum small, rather transverse. *Elytra* two-fifths longer than wide, about twice as long as the prothorax, and, at the feebly tumid humeri, slightly wider than the latter; sides thence very feebly convergent, the apex broadly arcuate; disk with rather wide, very deep, obsoletely punctate grooves, the intervals flat, generally a little less than twice as wide as the grooves, each with a single series of very coarse, somewhat uneven, close-set punctures, those of the fourth and fifth intervals leaving but a narrow margin from their sides to the edge of the grooves; setæ small but robust and quite distinct. *Abdomen* somewhat strongly but sparsely

punctured. *Legs* rather coarsely, deeply, moderately closely punctate; tarsal claws moderate. Length 3.8–4.0 mm.; width 1.8 mm.

#### Arizona.

A single pair. In the male the abdomen is strongly impressed in the middle toward base, the impressed area being more finely and sparsely punctured. The prosternum is narrowly but distinctly impressed, coarsely but sparsely punctured, separating the coxæ by rather more than one-half of their width.

24 **Baris opacula** n. sp.—Elongate-oval, narrow, convex, deep black throughout, the legs with a feeble piceous tinge; lustre dull. *Head* finely, sparsely, the beak rather finely but deeply, somewhat closely punctate, the latter arcuate, not very robust, three-fourths as long as the prothorax; antennæ moderate, normal, first joint of the funicle as long as the next three, club rather robust, ovoidal, pointed, not as long as the scape, the first joint partially pubescent, feebly shining. *Prothorax* scarcely one-fourth wider than long, the apex subtruncate, nearly one-half as wide as the base; median lobe of the latter broad and feeble; sides broadly, evenly arcuate throughout, becoming subparallel in basal third; disk rather finely but very deeply and densely punctate, without median impunctate area, the punctures not quite one-half as wide as the scutellum and generally separated by less than one-half their width; interspaces shining. *Scutellum* small, transverse. *Elytra* one-half longer than wide, distinctly more than twice as long as the prothorax, at the feebly tumid humeri a little wider than the base of the latter, together rather gradually and strongly rounded behind; striæ rather fine, deep, abrupt, finely, remotely punctate, not crenulate except feebly toward base; intervals wide, flat, minutely, strongly granulate, dull, each with a single series of fine, moderately distinct punctures, confused on the second and third intervals; setæ very minute, not at all conspicuous. *Abdomen* polished, convex, rather sparsely punctate, the last segment densely so. *Legs* moderate, finely, sparsely punctate; tibiae straight externally. Length 4.0–4.7 mm.; width 1.65–2.1 mm.

#### California.

The prosternum is coarsely, somewhat closely punctate and very feebly impressed, and the coxæ are separated by one-half their width.

This is one of the most isolated species of the genus, easily identifiable by the opaque elytra, fine deep striæ and dense pronotal punctures.

25 **Baris porosicollis** n. sp.—Not very robust, convex, oval, deep black throughout, not strongly shining. *Head* finely, sparsely punctate, separated from the beak by a wide but distinct, obtusely angulate depression; beak rather arcuate, two-thirds as long as the prothorax, finely, closely punctate, more closely and very densely so at the sides; antennæ moderate, the



funicle rather slender except the basal joint, which is somewhat robust and scarcely as long as the next three, club rather small, robust, the first joint almost glabrous, polished. *Prothorax* scarcely more than one-fifth wider than long; sides feebly convergent and almost straight in basal three-fourths, then strongly rounded and convergent to the apex but not constricted; base three times as wide as the head, the median lobe rather narrow, rounded and distinct; disk rather finely, deeply, very densely punctate, the punctures somewhat uneven, one-half as wide as the scutellum and generally separated by one-third their width, a narrow imperfect median impunctate line evident in the type. Scutellum transverse, punctate. *Elytra* scarcely one-third longer than wide, twice as long as the prothorax, and, at the moderately tumid humeri, quite distinctly wider than the latter, broadly, obtusely rounded behind; disk not very coarsely but deeply, abruptly striate, the striæ with remote feeble punctures; intervals moderate in width, the fifth twice as wide as the striæ, flat, each with a single row of moderately large, strong, approximate punctures, confused on the second, third and fifth; setæ rather robust, short but distinct. *Abdomen* rather coarsely and densely punctured toward base. *Legs* finely, moderately closely punctate, the setæ short and silvery; tibiæ straight externally; tarsal claws rather small. Length 4.0 mm.; width 1.8 mm. (♀).

Nebraska.

Easily known by its rather long and narrow, densely punctate prothorax, very close-set punctures of the elytral intervals and somewhat dull lustre. The prosternum is rather deeply impressed, coarsely, moderately densely punctate, the coxæ separated by a little less than one-half their width.

I place with the type three specimens collected by Mr. Wickham at Greeley, Colorado, which differ only in having a single series on the fifth interval in both male and female, but which are otherwise similar throughout.

26 ***Baris punctiventris*** n. sp.—Oblong-oval, moderately convex, somewhat robust, polished throughout, black, the legs piceous. *Head* obsoletely punctate, the beak rather coarsely but not very densely so at the sides, rather stout but equal throughout, strongly arcuate and almost as long as the prothorax; antennæ normal. *Prothorax* rather short, nearly one-half wider than long; sides subparallel and very feebly arcuate in basal two-thirds, then strongly rounded, thence strongly convergent and nearly straight to the apex, which is transverse; base scarcely two and one-half times as wide as the head, subtransverse and straight, the median lobe small and feebly developed; disk without median line, the punctures coarse deep and perforate, three-fourths as wide as the scutellum, rather unevenly distributed but generally separated by distinctly less than their own diameters, in apical fifth becoming abruptly very minute. Scutellum rather small. *Elytra* about two-fifths longer than wide, a little more than twice as long as the prothorax, and, at the very small

basal and feebly tumid humeri, slightly wider than the latter; sides behind the humeri just visibly convergent and very feebly arcuate, the apex evenly rounded, the sutural notch normal; disk with deep abrupt obsolete punctate grooves, moderate in width toward base, becoming much narrower toward apex; intervals rather wide, flat, each with a single series of small feeble punctures, which become larger and close-set toward base but very minute and widely distant toward apex; setæ scarcely at all visible. *Abdomen* throughout coarsely deeply and very densely punctured. *Legs* moderate, the hind tibiæ scarcely more than two-thirds as long as the femora, straight; tarsi slender, the basal joint but slightly longer than the second; claws small. Length 2.8–3.2 mm.; width 1.3–1.6 mm.

Louisiana; Missouri; Indiana.

This small species can easily be identified by the peculiar punctuation of the pronotum and abdomen as detailed in the description. The prosternum is very feebly impressed and widely separates the coxæ. The three specimens before me are apparently females, but as they differ greatly in relative stoutness of form, it is possible that the more slender specimen from Louisiana, assumed as the type, may be a male, and that in that sex the abdominal impression is obsolete.

27 **Baris rubripes** n. sp.—Oblong, moderately convex, highly polished, piceous-black, the legs rufous. *Head* minutely, rather sparsely punctured, with a small punctiform fovea in the transverse impression, the beak strongly, moderately densely punctate, arcuate, about three-fourths ( $\frac{3}{4}$ ) to four-fifths ( $\frac{4}{5}$ ) as long as the prothorax; antennæ somewhat less robust than usual, the funicle long, with the second joint a little longer than wide, the third feebly transverse, club short but robust. *Prothorax* two-fifths wider than long, the sides almost evenly and rather strongly arcuate from base to apex sometimes a little more abruptly convergent near the latter; base distinctly less than three times as wide as the head, transverse, the median lobe narrow but pronounced; disk widest slightly before the base, with a rather wide distinct impunctate area which is subentire; punctures somewhat coarse, deep and dense, about three-fourths as wide as the scutellum and separated by less than one-half their diameters. Scutellum unusually small, subquadrate, slightly tumid. *Elytra* two-fifths longer than wide, fully twice as long as the prothorax and not distinctly wider than the disk of the latter, the humeri feebly tumid; sides subparallel, the apex broadly but not very abruptly rounded; disk with deep, abrupt and rather wide grooves, which are not distinctly punctate, the intervals about twice as wide as the grooves, flat, each with a single series of coarse but not very deep, close-set punctures; setæ very short but moderately distinct. *Abdomen* rather finely, decidedly sparsely punctured. *Legs* moderate, somewhat strongly punctate; tarsal claws rather long. Length 3.2–4.8 mm.; width 1.3–2.1 mm.

California (Sonoma, Mendocino, Lake and Santa Cruz Cos.).

This species somewhat resembles *tenuestriata* in outward form, but is distinguishable at once by the coarse grooves and large interstitial punctures of the elytra. The abdomen in the male is feebly impressed in the middle toward base, the prosternum narrowly and distinctly impressed, and the anterior coxæ separated by rather more than one-half their width. The usual fine transverse groove bordering the anterior margin of the prosternum is quite distinct. The legs are sometimes darker and rufo-piceous in color. The large series of examples before me displays an unusual diversity in size but is otherwise quite homogeneous.

28 **Baris sparsa** Lec.—Proc. Ac. Nat. Sci., Phila., 1868, p. 364 (Bari-dius); Proc. Am. Phil. Soc., XV, p. 293.

This is a small narrow species, dark rufo-piceous in color, polished, with a feeble æneous tinge and with dark rufo-testaceous legs. The beak is rather slender, densely punctured, rather strongly arcuate, subequal in length to the prothorax in the female, but only three-fifths as long as the latter in the male. Prothorax rather elongate, from one-fourth to one-third wider than long, subparallel and broadly arcuate in basal two-thirds, then gradually convergent and straight to the apex, the basal lobe rather prominent; disk with a narrow but rather distinct subentire median line, the punctures deep strong and somewhat coarse, moderately close in the original male type and separated by nearly twice their widths, but rather closer in a single female taken by me in northern California. Elytra with fine but deep abrupt and impunctate striæ, the intervals nearly three times as wide as the grooves, perfectly flat, each with a single even series of coarse but very feeble widely spaced punctures, the setæ minute and almost invisible. The prosternum is broadly, feebly impressed and the anterior coxæ separated by barely one-half of their own width. Length 2.8 mm.; width 1.2 mm.

The above is an outline of the typical *sparsa* from Oregon and northern California, and care must be taken not to confound it with *rubripes* from the vicinity of San Francisco, which is a larger species, with narrower and much more densely and strongly punctate elytral intervals and denser pronotal punctures.

Oregon—Cab. LeConte; California (Hoopa Val., Humboldt Co.).

29 **Baris brunneipes** n. sp.—Oblong-oval, subparallel, convex, rather stout, black throughout, the legs brownish-testaceous, the femora in great part

piceous; lustre throughout strongly shining. *Head* minutely, moderately closely punctate, the beak more strongly, densely so, rugulose at the sides, very stout, arcuate, two-thirds as long as the prothorax; antennæ moderate, the club large, robust, ovoidal, its basal joint polished and sparsely setose. *Prothorax* large, scarcely one-fourth wider than long; sides broadly, evenly arcuate and convergent anteriorly, becoming nearly parallel in more than basal half; base three and one-half times as wide as the head, oblique and nearly straight from the scutellum to the basal angles, the median lobe very small and feebly developed; disk rather feebly convex, finely, densely, deeply punctate, without trace of median impunctate line, the punctures rather less than one-third as wide as the scutellum and separated by scarcely their own diameters. Scutellum very feebly impressed, subquadrate, but slightly wider than long. *Elytra* scarcely more than one-third longer than wide, quite distinctly less than twice as long as the prothorax, and, at the moderately tumid humeri, a little wider than the latter; sides subparallel; apex broadly, rather abruptly rounded; disk with rather narrow but very deep grooves, which are not distinctly punctate or crenulate, the edges slightly obtuse; intervals polished, nearly flat, each with a single series of coarse strong moderately approximate and somewhat uneven punctures, rather smaller and more or less confused on the second, third and fifth; setæ very small and scarcely observable. *Abdomen* rather finely but strongly, moderately closely punctate. *Legs* moderate, feebly, sparsely punctate, the tibiæ straight along the external edge; tarsal claws rather small. Length 4.8 mm.; width 2.3 mm.

#### California.

The single specimen is a male, and has the abdomen somewhat narrowly and feebly impressed in the middle near the base. The prosternum is very feebly impressed, and the coxæ separated by slightly less than one-half of their own width. The punctures of the prothorax are relatively finer than in any other form known to me, and the species is quite distinct in facies.

30 **Baris deformis** n. sp.—Oblong-oval, somewhat depressed above, black throughout, polished, without æneous lustre. *Head* obsoletely, the beak finely, rather strongly but not densely punctate, the latter rather robust, strongly arcuate, quite distinctly shorter than the prothorax; antennæ moderate. *Prothorax* short and strongly transverse, one-half wider than long, the sides rather strongly convergent and broadly distinctly sinuate in basal two-thirds, then rather broadly rounded, thence more convergent and nearly straight to the apex; base transverse and straight, the median lobe pronounced; disk without trace of median line, rather finely, very deeply and extremely densely punctate throughout. Scutellum moderate, subquadrate, strongly impressed along the middle. *Elytra* long, fully one-third longer than wide and very distinctly more than twice as long as the prothorax, at the small and moderately tumid humeri very slightly wider than the latter; sides nearly straight and distinctly convergent behind the humeri, the apex almost semi-circularly rounded, with the usual broad sutural notch; disk rather



finely but deeply and abruptly striate; intervals flat, fully twice as wide as the grooves, each with a regular series of somewhat small but deep, rather widely spaced punctures, the second and third a little wider but with the series simply uneven; setæ minute and not conspicuous. *Abdomen* finely but deeply punctured, the punctures distinctly separated toward the middle but becoming coarse and very dense toward the sides. Anterior coxæ widely separated. Length 3.0–3.5 mm.; width 1.5–1.7 mm.

North Carolina; Indiana; Missouri.

The peculiar form of the prothorax will always render this species easily identifiable. The type is a female from North Carolina. I have before me a single specimen from each of the above localities, the interstitial punctures being smaller in the Indiana female than in either of the other two.

31 **Baris futilis** n. sp.—Oblong-oval, convex, highly polished, black and with a strong æneous-metallic lustre. *Head* finely but distinctly, not very sparsely punctured, the beak moderately coarsely and closely so, densely at the sides, moderately robust and arcuate, short, about two-thirds as long as the prothorax; antennæ moderate, the club rather small. *Prothorax* two-fifths wider than long, the sides just visibly convergent and feebly arcuate in basal three-fourths, then strongly rounded, thence strongly convergent and feebly sinuate, faintly constricted to the apex, which is transversely truncate; base three times as wide as the head, straight, subtransverse, the median lobe rather large and prominent, rounded; disk with a more or less distinct impunctate median line; punctures rather coarse, very deep and moderately dense; sometimes crowded almost throughout, two-thirds as wide as the scutellum. Scutellum small, subquadrate. *Elytra* ample, two-fifths longer than wide, quite distinctly more than twice as long as the prothorax, and, at the small tumid humeri, slightly wider than the latter; sides behind the humeri subparallel; apex very broadly, evenly rounded; disk with moderately coarse, very deep, abrupt and finely but distinctly punctured grooves; intervals flat, about twice as wide as the grooves, each with a single somewhat uneven line of coarse, very approximate and slightly rugulose punctures, rather confused on the third, those of the fourth and fifth fully two-thirds as wide as the corresponding intervals; setæ small, suberect and forming quite distinct rows by longitudinal oblique illumination. *Abdomen* rather coarsely deeply and closely punctured toward the sides, more sparsely so in the middle of the first segment. *Legs* short, distinctly but not very densely punctured; tibiæ not prominent externally; claws moderate. Length 2.8–3.6 mm.; width 1.25–1.65 mm.

California (Sta. Barbara, Riverside and San Diego).

The prosternum in the type is scarcely at all impressed, the coxæ widely separated, the process being but slightly narrower than their acetabula.

Mr. H. C. Fall informs me that he has beaten this species from willows.

32 **Baris inconspicua** n. sp.—Oblong-oval, not very robust, the upper surface rather feebly convex, black and polished throughout, the legs somewhat piceous. *Head* very minutely, obsoletely punctured, the beak deeply and closely so, strongly arcuate, four-fifths as long as the prothorax; antennæ rather long, the club large, abrupt, compressed, with the basal joint sparsely setose and polished. *Prothorax* two-fifths wider than long; sides very feebly convergent and slightly arcuate from the base to apical sixth or seventh, then strongly convergent and feebly sinuate for the very short distance to the apex, which is transversely truncate and unusually wide; base but slightly more than twice as wide as the head, oblique and straight from the median lobe, which is small but distinct, rounded; disk not very coarsely but deeply and densely punctate, without impunctate line, the punctures nearly one-half as wide as the scutellum and separated by one-half to two-thirds their own diameters. Scutellum subquadrate, not distinctly impressed. *Elytra* nearly one-half longer than wide, slightly more than twice as long as the prothorax, and, at the small and moderately prominent humeri, slightly wider than the latter; sides parallel, nearly straight; apex broadly but evenly rounded; disk with rather narrow but deep, abrupt, finely, obsoletely punctured grooves, the intervals flat, about twice as wide as the grooves, each with a single even series of small feeble and not very close-set punctures; setæ very small and inconspicuous. *Abdomen* finely, rather feebly and sparsely punctate. *Legs* rather slender, feebly, sparsely punctate, the tibiæ straight; tarsal claws moderate. Length 3.2 mm.; width 1.3 mm. (♀).

Colorado.

In some respects this small species resembles *aperta*; it differs in its radically different shape of the prothorax, slightly smaller and denser pronotal punctuation, and less minute and distant interstitial punctures of the elytra; also in its more depressed form and rather shorter beak.

The prosternum is feebly but distinctly impressed and separates the coxæ by fully one-half of their own width.

33 **Baris confinis** Lec.—Proc. Ac. Nat. Sci., Phil. 1868, p. 362 (Bari-dius); Proc. Amer. Phil. Soc., XV, p. 293.

A small and very abundant species, easily distinguishable by the rather short, strongly, moderately coarsely and somewhat sparsely punctured pronotum, the rather wide, flat, somewhat finely distinctly and decidedly remotely punctured elytral intervals, with the punctures forming an even single series on each, and by the finely, sparsely punctured abdomen. I have before me ample series from Indiana and Florida (Key West), which agree very well, the difference being slight, apparently racial in nature and not easily expressible in language. Length 2.8–3.4 mm.; width 1.3–1.6 mm.

Pennsylvania, North Carolina, Georgia, Florida, Mississippi, Texas and Iowa. I have before me about fifty specimens, one of which, from Iowa, has the prothorax slightly more elongate than any of the others.

34 **Baris subsimilis** n. sp.—Oval, rather robust and but moderately convex, black throughout, highly polished and with a somewhat strong æneous metallic lustre. *Head* minutely, the beak rather strongly but not very densely punctate, the latter robust, evenly, moderately arcuate, short, about three-fourths as long as the prothorax; antennæ normal. *Prothorax* somewhat transverse, fully two-fifths wider than long; sides just visibly convergent and very feebly arcuate to apical fourth, then strongly but not prominently rounded, thence strongly convergent and straight to the apex, which is transversely truncate; base straight and very feebly oblique from the small and feeble median lobe to the sides; disk with narrow, feebly defined, almost entire median line, the punctures moderate in size and depth, not very dense, about two-fifths as wide as the scutellum and generally separated by nearly their own diameters. Scutellum small, very feebly impressed. *Elytra* ample, one-third longer than wide, a little more than twice as long as the prothorax, and, at the moderately tumid humeri, slightly wider than the latter; sides behind the humeri just visibly convergent, the apex rather gradually, semi-circularly rounded; disk with deep, moderately coarse, minutely, feebly punctate grooves, the intervals flat, about twice as wide as the grooves, each with a single series of fine but rather deep and distinct, moderately close-set punctures, which are confused on the third interval but not at all on the second, and also confused on the fifth toward base; setæ very small, not conspicuous. *Abdomen* rather coarsely, strongly and quite densely punctured. *Legs* coarsely but feebly, sparsely punctate; tibiæ straight; tarsal claws small. Length 3.4–4.0 mm.; width 1.5–1.9 mm.

Pennsylvania; Indiana; Missouri.

This species somewhat resembles a large *confinis*, but has the interstitial punctures more close-set, the abdomen more densely and rugosely punctured, and the beak decidedly shorter and thicker. The prosternum is very feebly impressed and separates the coxæ by about one-half of their own width.

35 **Baris socialis** n. sp.—Oblong-oval, rather slender, moderately convex, polished, black throughout. *Head* and beak finely, sparsely punctate, the latter not very densely so at the sides, feebly, evenly arcuate throughout, three-fourths as long as the prothorax; antennæ normal. *Prothorax* two-fifths wider than long, the sides slightly but distinctly convergent and feebly arcuate to apical fourth, then more strongly rounded, thence moderately convergent and straight or just visibly sinuate to the apex, which is broadly, feebly arcuate; base subtransverse, a little less than three times as wide as the head, the median lobe small but distinct; disk rather feebly convex, not

more strongly so anteriorly, with a rather wide but ill-defined subentire median line, the punctures moderate, deep, somewhat sparsely and unevenly distributed, less than one-half as wide as the scutellum and separated by between once and twice their own diameters. Scutellum moderate, tumid, nearly as long as wide. *Elytra* two-fifths longer than wide, fully twice as long as the prothorax, and, at the rather prominent humeri, distinctly wider than the latter; sides behind the humeri quite distinctly convergent, the apex rather gradually and semi-circularly rounded; disk with somewhat coarse, very deep, finely, remotely punctured grooves, the intervals flat, generally one-half wider than the grooves, each with a single series of somewhat deep, moderately large punctures, the second and third intervals much wider than the others, the former with the punctures slightly uneven, the latter rather broadly confused; punctures generally close-set; setæ very minute and inconspicuous. *Abdomen* rather coarsely, deeply, moderately closely punctured. *Legs* strongly but sparsely punctured. Length 3.6 mm.; width 1.7 mm.

Missouri; Texas.

Described from the female. This species does not seem to be very closely allied to any other in general facies, but it is difficult to make this clear from description only. It is distinguishable by its sparsely, moderately coarsely punctate and somewhat depressed pronotum from several of those to which it is more closely related. From *confinis*, it differs in its more elongate form and black color, never being in the least æneous.

36 **Baris aperta** n. sp.—Oblong-subcylindrical, dark rufo-piceous, the pronotum blackish; integuments highly polished. *Head* very minutely sparsely and obsoletely punctate, the beak rather sparsely but strongly so, especially at the sides, somewhat slender, strongly arcuate, three-fourths as long as the prothorax; antennæ rather long, moderately robust, normal in structure. *Prothorax* rather more than one-third wider than long, the sides very evenly and rather strongly arcuate from base to apex; base two and two-thirds times as wide as the head, transverse, straight, the median lobe small but distinct; disk convex, without distinct median line, the punctures slightly coarse, deep and dense, about two-thirds as wide as the scutellum and separated by scarcely one-half their own diameters. Scutellum small, slightly tumid. *Elytra* nearly one-half longer than wide, twice as long as the prothorax and not distinctly wider than the latter, rather gradually and semi-circularly rounded at apex, the humeri feebly tumid; disk with abrupt, very deep, moderately coarse grooves which are very obsoletely punctate at the bottom; intervals flat, about twice as wide as the grooves, each with a single line of very fine but distinct, widely-spaced punctures; setæ minute and inconspicuous. *Abdomen* finely, rather feebly and very sparsely punctured throughout, but, as usual, densely so on the fifth segment and pygidium. *Legs* sparsely, feebly punctate; tibiæ not sinuate externally, the tarsal claws moderate. Length 3.0 mm.; width 1.3 mm.



## Dakota.

The small size, rounded sides and densely, strongly punctured surface of the prothorax, coarse grooves, and very fine distant interstitial punctures of the elytra, will probably serve to identify this species, which is of unusually cylindrical form. The prosternum is rather narrowly but quite distinctly impressed, and separates the coxæ by a little less than one-half of their own width. The unique specimen is a female.

37 **Baris abrupta** n. sp.—Oblong-oval, convex, rather stout, black throughout, highly polished and with a pronounced æneous lustre; setæ minute and inconspicuous. *Head* minutely, very remotely punctate, the beak strongly but not densely or coarsely so, stout, strongly arcuate, scarcely more than three-fourths as long as the prothorax, the antennæ inserted a little behind the middle. *Prothorax* short and transverse, fully three-fourths wider than long, the sides feebly convergent and almost straight to apical third, then abruptly, strongly rounded and prominent, thence very strongly convergent and feebly constricted to the apex, which is feebly arcuate and scarcely one-half as wide as the base, the latter straight and slightly oblique at each side of the small, broadly rounded median lobe; disk without impunctate line, the punctures strong and rather dense, about two-fifths as wide as the scutellum and separated generally by about one-half of their own diameters. *Scutellum* moderate, feebly transverse, scarcely impressed. *Elytra* large, very slightly wider than the prothorax and fully twice as long, a little longer than wide, hemi-elliptical in outline, the humeri but very slightly prominent; striæ deep, abrupt, even, not very coarse, the intervals flat, fully twice as wide as the grooves, each with a single series of very small, not close-set punctures, the second and third wider and with the punctures more or less confused. *Abdomen* distinctly but rather sparsely punctured. *Prosternum* broadly, strongly impressed along the middle, separating the coxæ by fully three-fifths of their own width. Length 3.4 mm.; width 1.65 mm.

## Pennsylvania.

The unique type is a male, having a large, rather strong impression toward the base of the abdomen. This species resembles *deformis*, but differs decidedly in its strong æneous lustre, prominent and strongly rounded sides of the prothorax at apical third, and finer interstitial punctures.

38 **Baris tenuestriata** n. sp.—Oblong-oval, convex, black throughout, polished, the elytra finely reticulato-granulose and more or less feebly alutaceous. *Head* minutely and not very sparsely punctate, beak three-fourths as long as the prothorax, stout, feebly arcuate, somewhat coarsely, deeply and closely punctate; antennæ robust, funicular joints three to seven transverse, gradually wider, the club moderately robust and almost perfectly continuous in outline with the outer joints of the funicle, first joint of the latter scarcely

as long as the next three. *Prothorax* one-third wider than long; sides feebly convergent and nearly straight to apical fourth, then strongly rounded, thence convergent and nearly straight to the apex; base three times as wide as the head, on each side straight and feebly oblique, the median lobe small and very feeble; disk with a narrow, more or less imperfect median impunctate line which is sometimes obsolete; punctures rather coarse, about two-thirds as wide as the scutellum, deep, dense, generally separated by much less than one-half their widths, often almost contiguous. Scutellum rather small, longitudinally, narrowly impressed in the middle, but slightly wider than long, subquadrate. *Elytra* nearly one-half longer than wide, twice as long as the prothorax, and, at the moderately tumid humeri but slightly wider than the latter; sides parallel; apex semi-circularly, not abruptly rounded; disk with fine but deep, abruptly limited grooves, which are finely and distantly crenulate along their edges; intervals flat, three times as wide as the striæ, each with a single series of very small feeble rather distant punctures; setæ extremely small, scarcely observable. *Abdomen* rather strongly but not very densely punctate. *Legs* feebly, sparsely punctate; tibiæ straight externally; tarsal claws moderate. Length 4.2–5.0 mm.; width 1.8–2.2 mm.

California (near San Francisco).

Among the six specimens before me a considerable amount of variation is observable, especially in a rather large male which is relatively stouter, with the prothorax as wide as any part of the elytra, and having the sides parallel in basal three-fourths. The peculiarity of the other discrepant form, which is an unusually large female, lies in the fact that the elytral intervals are slightly convex, the pronotal punctures being densely crowded and contiguous, and without vestige of impunctate median line. I have but little doubt, however, that they belong to this species.

The description is taken from a male, the abdominal impression being unusually wide and extending only slightly upon the second segment. The sexual differences in the beak are hardly noticeable.

39 **Baris macra** Lec.—Pac. R. R. Exp'l and Surv., Ins., p. 58 (Bari-dius); Proc. Ac. Nat. Sci., Phila., 1868, p. 362; Proc. Am. Phil. Soc., XV, p. 294.

The form of this small and distinct species is unusually narrow, rather more so in fact than any other true *Baris* which I have seen. The beak in the male is moderately stout, deeply, closely punctate at the sides, distinctly arcuate and about three-fourths as long as the prothorax, the latter scarcely over one-fourth wider than long, with the sides feebly convergent and slightly arcuate from base to apex; the apex is fully two-thirds as wide as the base and broadly,

evenly arcuate; disk rather finely, deeply and closely punctate, with a narrow, feebly defined, abbreviated median line. Elytra twice as long as the prothorax, very finely but deeply and abruptly striate, the intervals flat, fully three times as wide as the grooves and each with a single series of extremely minute, very remote and subobsolete punctures, the setæ not obvious.

*Macra* somewhat resembles *sparsa* in outward habitus, but differs in its still more slender form, finer, closer pronotal punctuation and much more minute interstitial punctures. Length 2.9 mm.; width 1.1 mm.

California. Cab. LeConte.

40 **Baris discipula** n. sp.—Oblong, slender, rather convex, black throughout, the legs piceous; integuments highly polished and with a pronounced æneous lustre. *Head* obsoletely punctate, the beak moderately coarsely and closely so, distinctly arcuate and fully four-fifths as long as the prothorax in the male, nearly straight and fully as long as that part in the female; antennæ normal. *Prothorax* rather long, scarcely one-third wider than long, the sides subparallel in basal three-fourths, then rather abruptly and strongly rounded, thence strongly convergent and more or less sinuate to the apex; base two and one-half times as wide as the head, subtransverse and straight, the median lobe rather large and distinct; disk with scarcely a trace of median impunctate line, the punctures moderately coarse, deep and somewhat close, about two-thirds as wide as the scutellum, rather uneven in distribution but generally separated by less than their own diameters. Scutellum very small, slightly tumid, nearly circular. *Elytra* scarcely more than one-fourth longer than wide, not quite twice as long as the prothorax, at the feebly tumid humeri but slightly wider than the latter; disk with rather fine but abrupt, deep, obsoletely punctate grooves, the intervals wide, flat, each with a single series of minute feeble and remote punctures, not confused on the subsutural intervals. *Abdomen* finely, sparsely punctate. Length 2.5 mm.; width 1.0–1.15 mm.

Indiana.

A single pair. In the male the abdomen has a small and moderately deep impression very near the base. The sexual disparity in the form and length of the beak is rather unusual in *Baris*, although common in those genera having a greater longitudinal development of this part of the body; it is also very noticeable in *sparsa*. This species differs from *ærea*, which it resembles in size, lustre and elytral sculpture, in its narrower, more parallel form, longer, rather more coarsely and decidedly more densely punctured pronotum, and longer beak.

41 **Baris ærea** Boh.—Sch. Cure., VIII, i. p. 141 (Baridius).

This species is one of the smallest of the genus, of moderately stout convex form, and is always highly polished and quite strongly æneous in lustre. The beak is short, robust, feebly arcuate and about two-thirds as long as the prothorax, the latter rather transverse, from one-third to two-fifths wider than long, and with the punctures very sparse, somewhat fine, moderately deep and separated by from two to three times their own diameters, without median impunctate line. The scutellum is small, flat and almost circular. The elytra are not quite twice as long as the prothorax, rather distinctly narrowed behind the humeri, with fine but deep and abrupt, minutely punctulate grooves, the intervals wide, flat, and each with a single series of very minute, remote punctures, not confused on the second or third. Length 2.3–2.9 mm.; width 1.1–1.4 mm.

This series of fifteen or more specimens before me is from Louisiana and Texas.

42 **Baris scintillans** n. sp.—Oval, moderately convex, black, the legs slightly piceous; integuments very smooth, brightly polished and with a strong æneous metallic lustre. *Head* obsoletely, the beak finely and very sparsely punctured, the latter rather robust, evenly and moderately arcuate, not distinctly shorter than the prothorax; antennæ normal. *Prothorax* rather short and transverse, two-fifths wider than long; sides subparallel and just visibly arcuate to apical third, then strongly rounded, thence strongly convergent and distinctly sinuate to the apex, the latter very feebly arcuate, one-half as wide as the base, the latter about two and one-third times as wide as the head, transverse, the median lobe rather wide and distinct, rounded; disk without median line, the punctures fine but deep, sparse, about one-half as wide as the scutellum and separated by two to three times their own diameters, almost completely obsolete in apical fifth. Scutellum very small, nearly circular. *Elytra* scarcely more than one-fourth longer than wide, a little more than twice as long as the prothorax, and, at basal third, very distinctly wider than the latter; sides parallel and feebly arcuate, the humeri feebly tumid, not at all prominent laterally; apex broadly, almost semi-circularly rounded; disk very finely but deeply and abruptly striate, the striæ not visibly punctate; intervals wide, flat, three to four times as wide as the striæ, each with a single series of excessively minute, feeble, remote punctures, which are only observable under special conditions of amplification and illumination; setæ not observable under moderate power. *Abdomen* finely, sparsely punctate, the metasternum quite coarsely, deeply and densely so. Anterior coxæ rather widely separated. Length 2.2 mm.; width 1.0 mm.

Florida (southern). Mr. Jülich.

The sex of the unique type is not evident, but the abdomen appears



to be very feebly impressed near the base. This is the smallest species known to me, and is quite distinct, differing from the form assumed to represent *ærea*, in its smaller size, longer beak, larger head, still stronger æneous lustre, and more constricted prothorax. The base of the pronotum is nearly three times as wide as the head in *ærea*, and the grooves of the elytra are much coarser, the interstitial punctures being more evident; in *scintillans* the latter are as nearly as possible completely obsolete.

43 **Baris æneomicans** n. sp.—Oblong-oval, somewhat depressed, highly polished, black throughout and with a strong æneous metallic lustre. *Head* not distinctly punctate; beak finely but deeply punctate, the punctures sparse even at the sides, thick, strongly arcuate, very nearly as long as the prothorax; antennæ somewhat slender, the club not very large. *Prothorax* widest before the base, transverse, fully one-half wider than long, somewhat inflated, the sides subparallel in basal three-fourths and strongly arcuate, then moderately convergent and feebly sinuate for a short distance to the apex, which is transversely truncate; base a little less than three times as wide as the head, straight and feebly oblique from the small and feeble median lobe to the basal angles; disk with a narrow and feebly defined but subentire median line, the punctures coarse and rather sparse, deep and perforate, about one-half as wide as the scutellum and separated by nearly their own diameters. Scutellum moderate, subquadrate, not longitudinally impressed. *Elytra* two-fifths longer than wide, quite distinctly more than twice as long as the prothorax, and, at the rather large and tumid humeri, very slightly wider than the disk of the latter; sides feebly convergent from behind the humeri, the apex almost evenly and semi-circularly rounded; disk with rather narrow but abrupt and very deep, finely, remotely punctate grooves, the intervals flat, rather more than twice as wide as the grooves, each with a single even series of small but distinct, widely distant punctures, which are not at all confused on the second or third; setæ very minute and almost completely invisible. *Abdomen* not very finely but feebly and very sparsely punctured. *Legs* rather coarsely and deeply but sparsely punctate; tibiæ straight; tarsal claws small. Length 3.5 mm.; width 1.65 mm.

Massachusetts.

A decidedly distinct species, distinguishable by the bright æneous lustre, sparse punctuation, short, laterally arcuate prothorax and somewhat depressed form. The prosternum is feebly impressed and widely separates the coxæ. The single specimen is apparently a female.

44 **Baris hyperion** n. sp.—Feebly rhomboid-oval, convex, highly polished and with a strong bronzy-æneous lustre; legs black; setæ very minute, sparse and inconspicuous. *Head* extremely minutely, sparsely punctate, the beak more strongly but not closely so, very robust, arcuate, flattened

near the apex, four-fifths as long as the prothorax; antennæ moderately stout, the basal joint of the club highly polished. *Prothorax* rather transverse, nearly one-half wider than long, the sides feebly convergent to apical third, then more strongly rounded and convergent but scarcely at all constricted to the apex, which is about one-half as wide as the base, the latter straight and feebly anteriorly oblique from the small but distinct median lobe to the basal angles; disk not coarsely but deeply, conspicuously and somewhat closely punctured, without trace of impunctate line, the punctures nearly one-half as wide as the scutellum and generally separated by about their own diameters. Scutellum small, quadrate, scarcely at all impressed. *Elytra* but little wider than the prothorax, about twice as long as the latter; humeri rather prominent; sides distinctly convergent; apex obtuse; striæ moderately fine, deep, abrupt, the intervals nearly flat, fully twice as wide as the grooves, each with a single series of fine, rather distant punctures, the second, and especially the third, much wider, the latter with the punctures confused. *Abdomen* finely, sparsely punctate. Prosternum strongly impressed along the middle, separating the coxæ by two-thirds of their own width. Length 3.5–4.0 mm.; width 1.65–2.0 mm.

Florida.

Somewhat related to *æneomicans*, but easily distinguishable by its more elongate, more finely punctate prothorax, with the sides much less rounded, and by its relatively shorter beak.

45 ***Baris vitreola*** n. sp.—Oblong-oval, rather robust, moderately convex, highly polished throughout, black with a strong æneous lustre, the elytra and legs rufo-piceous; setæ extremely minute and scarcely visible. *Head* just visibly and very remotely punctulate, the transverse impression moderate; beak very stout, cylindrical, flattened toward apex, finely but strongly, rather densely punctate, strongly, evenly arcuate and almost as long as the prothorax; antennæ moderate, the club small, oval, with the basal joint polished. *Prothorax* rather small and transverse, fully three-fifths wider than long, the sides quite evidently convergent and nearly straight from the base to apical fourth, then strongly rounded to the apex, the constriction obsolete; base not quite three times as wide as the head, straight and rather strongly oblique from the small and moderately prominent median lobe to the basal angles; disk strongly and sparsely punctate, without trace of impunctate line, the punctures about two-fifths as wide as the scutellum and generally separated by rather more than twice their own diameters. Scutellum subquadrate, scarcely at all impressed. *Elytra* slightly wider than the prothorax and fully twice as long, oblong, the sides behind the feebly prominent humeri just visibly convergent and slightly arcuate; apex broadly obtuse; striæ rather strong, deep, abrupt, finely punctured, the intervals flat, fully twice as wide as the grooves, each with a single series of very fine remote punctures, the third scarcely wider than the others. *Abdomen* sparsely punctate toward the middle, rather closely so laterally, the punctures becoming large but shallow. Prosternum strongly impressed along the middle, separating the coxæ by three-fifths of their own width. Length 3.4 mm.; width 1.75 mm.

## Florida.

The unique type is a male, the abdomen being broadly and rather strongly impressed in the middle toward base. There is no species very closely allied to *vitrea*, but *punctiventris* appears to approach it more closely than any other.

**46 *Baris ancilla*** n. sp.—Oval, not very stout, convex, strongly shining, the elytra with a scarcely perceptible alutaceous lustre; body black throughout, with a feeble bluish metallic lustre; setæ minute, extremely sparse and inconspicuous. *Head* excessively minutely, sparsely punctate, the beak more strongly but not very densely so, very stout, arcuate, gradually and feebly flattened toward apex, distinctly shorter than the prothorax; antennæ inserted a little behind the middle, the club moderate, with the basal joint polished and constituting rather less than one-half of the mass. *Prothorax* one-third wider than long, the sides evenly rounded and convergent in apical third, becoming nearly straight and parallel thence to the base, the latter twice as wide as the apex, feebly oblique at each side of the small but distinct, rounded median lobe; disk without impunctate space, the punctures strong but not coarse, about one-half as wide as the scutellum and generally separated by rather more than their own diameters. Scutellum small, quadrate, unimpressed. *Elytra* slightly wider than the prothorax and nearly twice as long, the humeri but feebly prominent; sides feebly convergent, gradually parabolic in apical third, the sutural notch strong, broadly angulate; striæ moderate, deep, even; intervals flat, a little more than twice as wide as the grooves, each with a single series of fine feeble and remote punctures, the second and third wider but similarly punctate. Under surface and abdomen æneous in lustre, the latter sparsely punctate. Prosternum sulcate, rather widely separating the anterior coxæ. Length 3.3 mm.; width 1.6 mm.

## Florida.

This species is slightly larger than *confinis* and differs in its much sparser punctuation; from *ærea* it differs in its more elongate form, much larger size, wider elytral intervals and finer striæ, and from *exigua*, to which it appears to be more closely allied, it may readily be known by its much finer and more remote interstitial punctures, longer and less rounded prothorax, with less oblique base, larger size and several other characters.

**47 *Baris splendens*** n. sp.—*B. interstitialis* Lec. nec Say: Proc. Am. Phil. Soc., XV, p. 293; Boh.: Sch. Curc. III, p. 684 (Baridius)?—Oblong-sub-oval, moderately convex, black and without æneous lustre but highly polished. *Head* obsolete punctulate, with an evanescent frontal puncture; beak very robust, evenly, moderately arcuate, two-thirds to three-fourths as long as the prothorax; antennæ normal, the club rather small. *Prothorax* rather transverse, two-fifths wider than long; sides broadly, evenly rounded and convergent anteriorly, becoming subparallel toward base, sometimes feebly prominent

at apical fourth; base not quite three times as wide as the head, straight and distinctly oblique from the very small and feeble median lobe to the sides; disk finely but distinctly, sparsely and somewhat unevenly punctate, with a narrow, feebly defined median line, the punctures less than one-half as wide as the scutellum and separated by two or three times their own diameters. Scutellum small, almost circular. *Elytra* two-fifths longer than wide, not quite twice as long as the prothorax, and, at the feebly tumid humeri, slightly wider than the latter; apex broadly, rather abruptly rounded; disk with somewhat coarse, deep, obsoletely punctate grooves, the intervals flat, generally but slightly wider than the grooves, each with a single series of minute but quite visible, remote punctures, the third interval much wider and with the punctures broadly diffused; setæ extremely minute, inconspicuous. *Abdomen* finely but rather strongly, sparsely punctate. *Legs* dark rufo-piceous in color, feebly and sparsely punctate. Length 3.3–4.1 mm.; width 1.5–1.9 mm.

Florida (Fernandina). Mr. Schwarz.

The prosternum is rather narrowly and quite strongly subsulcate, and separates the coxæ by scarcely one-third of their own width.

This is a distinct and easily recognizable species, but as it differs so radically from Say's description of *interstitialis* in the nature of the elytral punctuation, I do not think that it can be placed near that species; the latter is here regarded as being identical with *transversa*. In regard to Boheman's *interstitialis*, there must always be more or less doubt until the type can be compared, as there are several of these peculiar sparsely punctured Florida species, which will equally satisfy his description.

48 **Baris exigua** n. sp.—Oblong-oval, moderately convex, shining and piceous-black throughout. *Head* very minutely and obsoletely punctate, the beak rather coarsely and somewhat densely so, short, arcuate, three-fourths as long as the prothorax; antennæ moderate, normal, the first joint of the club polished and sparsely setose. *Prothorax* nearly one-half wider than long, widest before the base, the sides evenly, rather strongly arcuate, the apex broadly arcuate and continuous with the sides, the apical angles entirely obsolete; base nearly three times as wide as the head, straight and slightly oblique from the feeble median lobe to the sides; disk without trace of median impunctate area, the punctures fine but deep, not very dense, about one-half as wide as the scutellum and separated by distinctly more than their own diameters. Scutellum very small. *Elytra* two-fifths longer than wide, twice as long as the prothorax, and, at the feebly tumid humeri, very slightly wider than the disk of the latter; sides behind the humeri just visibly convergent, the apex broadly rounded, the sutural notch large and quite deep; disk with fine but deep, abrupt, finely, remotely punctured grooves, which are feebly crenulate near the base; intervals flat, nearly three times as wide as the grooves, each with a single series of fine but distinct, widely spaced punctures. *Abdomen* finely, sparsely punctate. *Legs* rather distinctly, moderately



closely punctured; tibiæ straight; third tarsal joint not wider than long, the emargination extending slightly beyond basal third; claws small. Length 2.6 mm.; width 1.2 mm. (♀).

Texas (near Austin).

The singular form of the prothorax, evenly rounded from the sides throughout the apex, the fine pronotal punctures, rather depressed form and small size, will readily distinguish this species. The prosternum is narrowly, feebly impressed, and separates the coxæ by much more than one-half of their own width. The elytral setæ are very minute and almost invisible under moderate power.

### **PLESIOBARIS** n. gen.

The species of this genus are for the most part small, generally quite minute, and for this reason will possibly prove to be somewhat numerous, especially as they are essentially characteristic of our comparatively unexplored extreme southern fauna. One or two species are known to occur in the more northern parts of the United States, but the majority will probably be found to inhabit subtropical Florida extending perhaps to Cuba.

The various representatives were regarded by LeConte as forming part of the genus *Pseudobaris*, but certainly cannot be appropriately placed there, because of their non-sulcate prosternum, moderately separated coxæ and small but perfectly free claws. They agree well together in the general nature of the vestiture, this being densely squamiform at the base of the third elytral interval, on the meso- and metasternal side-pieces, and at the sides of the last three ventral segments; elsewhere on the dorsal surface the large scales are sparse, and variously distributed according to the species.

The few forms here brought to notice already fall into two groups of almost subgeneric value, which however I will simply indicate in the following table:—

Basal joint of the antennal club large, composing at least one-half of the mass; body cylindrical, the elytral humeri not exposed; elytra each with a large sparsely squamose area behind the middle.

Black, the base of the prothorax rather strongly bisinuate; legs rufo-piceous; rostrum shorter than the prothorax.....1 **T-signum**  
Piceous-black; legs rufous, with the knees black; base of the prothorax transverse, just visibly and broadly bisinuate; very small species.

#### **2 signatipes**

Rufo-testaceous, the elytral suture clouded with black; base of the prothorax very broadly and feebly bisinuate; larger species.....3 **albilatus**

Basal joint of the club short, composing one-third of the mass or even less; elytra not continuous with the prothorax at the sides, the humeri more or less exposed and oblique; body and legs intense black throughout.

Pronotum with a regular but sparsely squamose design, the scales sparsely scattered over the elytra toward the sides, and also more or less distinctly clustered in several small spots on the third and fifth intervals.

#### 4 *æmula*

Pronotum without regular squamose design, the elytral vestiture consisting entirely of minute inconspicuous setæ which become slightly more robust, but scarcely squamiform, toward the sides, and with a squamose spot at the base of the third interval.....5 *disjuncta*

1 **Plesiobaris T-signum** Boh.—Sch. Gen. Curc., VIII, p. 154 (Baridius).

Pennsylvania—Boheman. There are but few statements concerning this species, which can be made with any degree of certainty. It however undoubtedly belongs to the present genus, and is probably also a member of the *albilatus* division, having the elytra cylindrical and continuous in outline with the prothorax at the sides.

The omission of exact measurements of length and width is a serious defect in the great work of Schönherr.

2 **Plesiobaris signatipes** n. sp.—Subcylindrical, convex, polished, piceous-black, the legs slightly paler, more rufous with the knees black, vestiture extremely minute and inconspicuous with the exception of a few large, widely scattered, white scales toward the middle and sides of the pronotum, a denser lineolate spot of the same at the base of the third elytral interval, and, behind the middle, a short even row of widely spaced scales on the second, third and fourth intervals, also a few widely distant scales on the fifth interval; on the under surface the meso- and metasternal side-pieces are densely clothed throughout with large white scales and also the last three abdominal segments laterally. *Head* and beak sparsely, feebly punctured, the latter moderately robust, feebly flattened toward apex, strongly, evenly arcuate and fully as long as the prothorax, the antennæ moderate, the joints of the funicle slightly convex at the sides, the second and third subequal and about as long as wide, the club small, briefly ovoidal, the basal joint composing fully one-half of the mass. *Prothorax* one-fifth wider than long, the apex feebly arcuate and two-thirds as wide as the base, the latter transverse, the median lobe broad and exceedingly feeble; sides parallel and straight to apical fourth, then rounded, thence straight and not at all constricted to the apex; disk with a rather wide but ill-defined impunctate line, the punctures rather large, one-half as wide as the scutellum but very feeble and sparse, separated by more than their own widths, becoming minute and still more feeble toward the apex, and also near the base except in the middle. Scutellum very small, subogival. *Elytra* barely twice as long as the prothorax and exactly equal to the latter in width, the sides straight and continuous, broadly but not

abruptly rounded behind; humeral tuberosities very small and feeble, not at all evident laterally; disk with very fine, moderately deep striæ, the intervals flat, four or five times as wide as the striæ, the second and third sensibly wider, each with a series of minute, feeble, distant and indistinct punctures. *Abdomen* very minutely, obsoletely and sparsely punctured toward the middle. Prosternum flat, not sensibly impressed, separating the somewhat small coxæ by about two-thirds of their own width. Length 1.75 mm.; width 0.6 mm.

Florida (Tampa). Mr. Schwarz.

The antennal differences between this species and *disjuncta* are very radical in the structure of the club, but I can perceive no other divergencies of a generic nature, and parallel inconstancy of this kind is well known in *Onychobaris*. *Signatipes* approaches more closely to the published characters of *T-signum*, than other species which I have seen, but differs in its piceous color, apparently sparser pronotal punctures and in several other characters, among the more important of which is the form of the basal line of the prothorax, said to be rather profoundly bisinuate in *T-signum*.

3 **Plesiobaris albilatus** Lec.—Proc. Am. Phil. Soc., XV, p. 298 (Pseudobaris).

Oblong-cylindrical, convex, polished, rufo-testaceous in color, the beak, under surface, knees and elytral suture piceous-black; punctures of the upper surface bearing very minute and inconspicuous setæ, with a few large scattered whitish scales toward the middle and sides of the pronotum, and a denser spot of the same at the base of the third elytral interval, the remainder of the elytra with a few large widely dispersed scales arranged subtransversely, and of which a loose spot on the second and third intervals is more distinct; meso- and metasternal side-pieces and lateral portions of the last three ventral segments abruptly very densely squamose. The beak is robust, strongly arcuate and fully as long as the prothorax, the antennæ slender, the funicle long, with joints two to four a little longer than wide and decreasing very slightly in length, the club small, with the basal joint composing distinctly more than one-half of the mass. Prothorax one-third wider than long, the sides parallel and nearly straight to apical fourth, then convergent and constricted, the base broadly and very feebly bisinuate, the disk with a wide but uneven impunctate line, the punctures rather coarse, deep and somewhat dense. The elytra are as in *signatipes*, but with the intervals equal and about four times as wide as the grooves. The prosternum is broadly, scarcely perceptibly impressed

anteriorly, and separates the coxæ by about two-thirds of their own width. Claws small, entirely free. Length 2.2–3.1 mm.; width 0.9–1.3 mm.

Florida (Tampa, Baldwin and Enterprise). The disposition of the scanty vestiture is somewhat remarkable; for example, on the fifth interval each puncture bears a minute and simple seta, but every third or fourth puncture bears instead, a very large fan-shaped scale placed in a transverse position. In spite of the great difference in size the present species and *signatipes* are closely allied.

In the species of this group the scattered scales seem to be easily removable, while in *æmula* they are exceedingly persistent.

4 **Plesiobaris æmula** n. sp.—Subcylindrical, strongly convex, shining, deep black throughout, the vestiture consisting of short broad white scales which are large in the dense spots, but elsewhere small; the scales are only present on the pronotum in an anteriorly dilated lateral vitta, which is prolonged inwardly along the basal margin almost to the middle, then abruptly flexed anteriorly and outwardly as a narrow line terminating at lateral third and middle of the length; on the elytra the scales are condensed in four small almost equidistant spots on the third interval, of which the basal is the largest, and thence to the side margins are widely but almost evenly scattered, but sometimes forming three spots on the fifth interval; on the under surface they are very dense on the meso- and metasternal side-pieces, and at the sides of the last three ventral segments. Head and beak not very strongly punctured, the latter short, very thick, strongly arcuate and subequal in length to the prothorax, the antennæ inserted a little beyond the middle, the basal joint of the funicle short, not twice as long as wide, the second and third very short, subequal, the club about as long as the preceding six, with its basal joint composing one-third of the mass. Prothorax one-third wider than long, the sides parallel and straight in basal three-fourths, then broadly subangulate, thence convergent, nearly straight and not at all constricted to the apex, the latter truncate and two-thirds as wide as the base, the latter transverse almost straight, the median lobe subobsolete; disk without median line, the punctures deep, moderate in size, very dense but not crowded. Scutellum very small, rounded. Elytra more than twice as long as the prothorax and a very little wider, parallel, parabolic in apical third, very finely but deeply striate, the intervals flat, moderately wide the third and fifth much broader than the others, each with a series of small feeble rather distant punctures; humeral tuberosities very feeble. Prosternum flat, separating the coxæ by rather more than their own width. Length 1.6–1.7 mm.; width 0.65–0.7 mm.

Florida. Mr. E. A. Schwarz.

This species was confounded by Dr. LeConte with the Zimmermann specimen from South Carolina, identified by him as *T-signum* Boh., and referred to below under *disjuncta*. It is a much smaller



species, and is not at all allied to the form mentioned. It was apparently taken in great abundance.

Among the specimens before me there is one which is singularly deformed, the pronotum having, near the base and at lateral fourth, a prominent polished wart-like tubercle. For a considerable distance around the tubercle, the small normal squamules are entirely absent but replaced by large scale-like plates, concave or umbilicate in the centre, each of which completely fills a puncture.

5 **Plesiobaris disjuncta** n. sp.—Subcylindrical, very slender, convex, black throughout, strongly shining, sparsely clothed with very small setæ, especially evident but not at all conspicuous toward the sides of the pronotum, very minute and sparse throughout on the elytra, the latter with a small elongate spot of white squamules at the base of the third interval, the meso- and metasternal side-pieces and sides of the last three ventral segments also densely squamulose, the remainder of the under surface subglabrous. *Head* very feebly, sparsely punctate, the impression rounded, feeble; beak shining, finely, deeply, moderately densely punctate, rather stout, cylindrical somewhat strongly, evenly arcuate, a little longer than the prothorax; antennæ moderate, the club rather large, as long as the preceding six joints combined, the latter short and coarctate. *Prothorax* about one-fourth wider than long, the sides feebly divergent and nearly straight from the base almost to the apex, then rounded for a short distance, the subapical constriction very small and feeble; apex truncate, nearly as wide as the base, the latter broadly, very feebly bisinuate; disk with moderately coarse, deep, perforate punctures which are almost contiguous, the impunctate line narrow and feebly defined, only visible toward the centre. Scutellum small. *Elytra* at the base abruptly quite distinctly wider than the prothorax, rather more than twice as long as the latter, the sides parallel and almost straight, somewhat abruptly, acutely ogival in apical third; humeri obliquely rounded, the callus not conspicuous; disk with fine striæ, becoming coarse near the base, the intervals two to three times as wide as the striæ, each with a single series of fine remote punctures, becoming closer and more distinct toward base. *Abdomen* rather strongly, coarsely and closely punctured, especially toward base. Prosternum broadly, feebly impressed, separating the coxæ by quite distinctly less than their own width. Length 1.7–2.1 mm.; width 0.6–0.8 mm.

Michigan; Missouri; Indiana; South Carolina.

This species was considered by LeConte as possibly representing Boheman's *Baridius T-signum*, but it is evidently a widely different species. The original description of *T-signum* includes the phrase "elytris antice thoracis basi non latiora," and also states that the rostrum is shorter than the prothorax, the elytra having a small sparsely squamose maculation behind the middle, and the legs rufopiceous. One of the most conspicuous characters of *disjuncta* relates

to the form of the humeri, the elytra being abruptly much wider than the base of the prothorax, and in the type there is no trace of a squamose maculation behind the middle of the elytra, nor any indication of such a spot, as all the punctures are occupied by small slender setæ.

### **PYCNOBARIS** n. gen.

In many respects this genus is allied to *Baris*, but its species have a distinctly different habitus due to the scaly vestiture. In its structural characters, it is similar to *Baris* in the form of the antennal club with its basal joint polished and composing fully one-half of the mass, also in its short robust beak and free tarsal claws. The flat prosternum separates the coxæ rather more widely than in any species of *Baris*, and in this peculiarity it approaches *Onychobaris*; the fine and abrupt frontal groove differentiates it, however, from both of these genera and allies it with *Stictobaris*, from which again it differs in its robust convex body and non-tubulate prothorax. The prothorax is more distinctly constricted near the apex than in *Baris*, but is never tubulate.

The beak is always shorter than the prothorax, the epistomal lobe short, truncate and limited at each side by a small oblique fissure as in *Baris*. Mandibles well developed, arcuate, overlapping in repose and deeply notched at apex. The buccal opening is rather smaller than in *Baris*, and its plane is more oblique to the under surface of the beak behind it. The scutellum is quite different from that of the last-named genus being distinctly bisinuate at apex. Tarsal claws rather long, widely divergent.

Our two species may be defined as follows:—

Vestiture rather sparse, the whitish scales very narrow, producing merely a decided pruinose appearance.....1 **pruinosa**  
 Vestiture dense, the scales broad, almost entirely concealing the surface.

2 **squamotecta**

1 ***Pycnobaris pruinosa*** Lec.—Proc. Am. Phil. Soc., XV, p. 294 (*Baris*).

Robust, oblong-oval and strongly convex, black throughout, the integuments polished but clothed uniformly, although not very densely, with long narrow subrecumbent scales. The beak is robust and feebly arcuate, scarcely more than three-fourths as long as the prothorax, the antennæ rather short and robust, with the second

and third funicular joints short and equal, the outer joints very wide and subcontinuous with the club in outline, the latter moderate, the basal joint polished and sparsely setose, constituting about one-half the mass, the remaining rings short and each abruptly and conspicuously less in transverse diameter than the preceding. Prothorax one-third wider than long, the sides feebly convergent and broadly arcuate very nearly to the apex, then more convergent and broadly but distinctly constricted; basal lobe rather narrow but very prominent, the disk with an extremely narrow impunctate line, the punctures rather small, about one-fourth as wide as the scutellum and distinctly separated. Scutellum slightly transverse, the posterior margin with two narrow deep notches. The elytra are but slightly more than one-half longer than the prothorax, the striæ very fine but deep, the intervals broad, flat, slightly uneven in width, finely closely and confusedly punctate throughout, and from five to six or seven times as wide as the striæ. Prosternum flat, separating the coxæ by a little less than their own width, nearly as in *Onychobaris*, but apparently not at all foveate anteriorly. Length 3.2–4.2 mm.; width 1.6–2.2 mm.

Texas and Colorado. Moderately abundant.

**2 *Pycnobaris squamotecta*** n. sp.—Robust, ovoidal, strongly convex, the integuments black and polished throughout but covered densely with long wide truncate and recumbent scales of a yellowish tint. *Head* minutely, sparsely punctate and glabrous, the transverse groove very deep and abrupt, the beak robust, densely punctate and squamose but narrowly impunctate and subcarinate in the middle toward base, moderately, evenly arcuate and about three-fourths as long as the prothorax; antennæ stout, densely squamose, nearly as in *pruinosa*, the large basal joint of the club highly polished and having widely scattered stiff setæ. *Prothorax* fully one-third wider than long, the sides rather strongly convergent and feebly arcuate from the base to apical fifth, then broadly rounded but not prominent and broadly strongly constricted to the apex, the latter not at all tubulate, broadly arcuate and two-fifths as wide as the base; basal lobe small but prominent; disk with a narrow impunctate line, indistinct before the middle, the punctures small, not much more than one-fourth as wide as the scutellum and separated by nearly one-half of their own diameter. Scutellum trapezoidal, nearly twice as wide posteriorly as at base, the posterior margin broadly, feebly bisinuate and the surface behind broadly impressed, the angles acute. *Elytra*, at the large but very feebly prominent humeri, only slightly wider than the prothorax, nearly two-thirds longer than the latter, the apex broadly obtuse; disk with fine rather shallow striæ, the intervals five or six times as wide as the striæ, finely but deeply, confusedly and rather sparsely punctate throughout, the scales

of the stria punctures being exactly equal in size and form to those of the intervals. *Abdomen* finely, not densely punctate, the scales large and dense. Prosternum flat, separating the rather large coxæ by not quite their own width. Length 4.7 mm.; width 2.4 mm.

Texas.

Easily distinguishable from *pruinosa* by the dense vestiture of broad recumbent scales. A single specimen.

### STICTOBARIS n. gen.

The few components of this genus are distinguished by a rather depressed body, extremely coarse and deeply perforate sculpture of the pronotum, and a rather short prothorax which is strongly tubulate at apex. The anterior coxæ are large and somewhat narrowly separated. Although the prosternum is feebly impressed, a certain decided relationship with *Onychobaris* is rendered evident by the two deep foveæ situated near the apex. It resembles *Baris* in the large basal joint of the antennal club, though this is not a character of decisive generic import, but differs from both the genera referred to in the deep and abrupt transverse frontal groove or constriction.

The beak is rather short and stout, with the epistomal lobe short and broadly sinuate at apex and the mandibles somewhat well developed, arcuate, notched at apex and partially decussate when closed. The vestiture consists simply of rather long sparse stout semi-erect and whitish or yellowish-white setæ or setiform squamules, which are sometimes denser on the second to fifth elytral intervals behind the middle, a character heretofore noticed in one of the groups of *Plesiobaris*, and also occurring in several species of *Centrinus*.

The three known species may be thus distinguished:—

- Setæ moderate in length, yellowish, condensed at the base of the third interval and also on intervals two to five in a rather large area behind the middle; body oblong; legs rufous.....1 **cribrata**
- Setæ longer, more robust and whiter, not in the least condensed at the points mentioned under the preceding species.
- Body rather robust, oblong, obtusely rounded at apex; beak densely punctate; legs black.....2 **pimalis**
- Body narrow, rather narrowly rounded behind; size much smaller; beak more sparsely punctate; legs rufous.....3 **subacuta**



1 **Stictobaris cribrata** Lec.—Proc. Am. Phil. Soc., XV, p. 296 (Onychobaris).

Oblong-oval, somewhat depressed, shining, blackish-castaneous, the legs ferruginous; setæ somewhat robust, moderate in length, yellowish-white, more especially evident toward the sides of the prothorax, in a dense humeral spot and another one more elongate at the base of the third interval, also more or less distinctly denser on intervals two to five in a limited area behind the middle. The beak is robust, strongly arcuate and quite distinctly shorter than the prothorax, the antennæ moderate, the funicle thick, the club rather robust but not large, the basal joint composing fully one-half of the mass, with the pubescence moderately dense. The prothorax is two-fifths wider than long, with the apex strongly constricted and tubulate, the median line narrow and ill-defined, and the punctures perforate, deep, fully three-fourths as wide as the scutellum, uneven in distribution but generally separated by nearly one-half their own diameters. Elytra distinctly more than twice as long as the prothorax, the intervals subequal, about one-half wider than the grooves, the third a little wider. The prosternum is not distinctly impressed and separates the rather large coxæ by scarcely more than one-half their own width. Length 3.3–4.0 mm.; width 1.4–1.7 mm.

Texas (Waco). Cab. LeConte. Easily recognizable by the peculiar arrangement of the elytral setæ.

2 **Stictobaris pimalis** n. sp.—Oblong, subdepressed, shining, intense black throughout and sparsely, evenly clothed with rather long, robust, perfectly white setæ, without trace of condensation, except feebly on the anterior declivity of the humeral callosities. *Head* finely, very sparsely punctate, glabrous, the groove narrow and deep; beak robust, densely and deeply punctate throughout, densely setose, without trace of impunctate line, feebly arcuate, almost as long as the prothorax in the female, but quite distinctly shorter in the male; antennæ moderate, the scape rather long, the second funicular joint but very little longer than the third, outer joints gradually very thick and subcontinuous in outline with the club, the latter moderately robust, with the basal joint constituting rather more than one-half the mass. *Prothorax* two-fifths wider than long, the sides subparallel or very feebly convergent and nearly straight to apical fourth, then abruptly, strongly rounded and almost transversely convergent to the constriction, which is very strong, the apex strongly tubulate, truncate and three-fifths as wide as the base, the latter subtransverse, the median lobe moderate, rounded and distinct; disk with extremely narrow and imperfect impunctate line, the punctures very coarse, deep and dense, three-fourths as wide as the scutellum and more or less polygonally crowded. Scutellum moderate, slightly wider than long,

impressed along the middle. *Elytra* slightly wider than the prothorax and distinctly more than twice as long, the humeri not prominent laterally; sides subparallel, generally feebly arcuate, the apex somewhat obtusely rounded; disk with moderate striæ, becoming coarse near the base, the intervals flat, slightly unequal, two to three times as wide as the striæ, rather finely, not densely, somewhat rugulose and confusedly punctured throughout. *Abdomen* finely, sparsely punctate. Prosternum broadly and very feebly impressed, with two deep subapical foveæ as in *Onychobaris*, but less distant; coxæ large, separated by scarcely more than one-half of their own width. Length 3.5-4.3 mm.; width 1.45-1.8 mm.

#### Arizona.

The four specimens in my cabinet form a perfectly homogeneous series, and represent a species differing greatly from *cribrata* in the white pubescence, uniformly distributed and without trace of condensation behind the middle or at the base of the third interval, also in its larger size, denser pronotal punctures and completely black body and legs.

3 ***Stictobaris subacuta*** n. sp.—Elongate-elliptical, convex, shining, piceous-black, the legs rufous; setæ long, very robust, uniformly distributed and without trace of condensation at the base of the third interval or behind the middle. *Head* very finely, sparsely and feebly punctate, minutely reticulate and alutaceous, the groove rather shallow but distinct; beak somewhat coarsely but sparsely punctate, moderately strongly arcuate and subequal in length to the prothorax; antennæ moderate, the club somewhat robust, normal, the second funicular joint short and but slightly longer than the third. *Prothorax* scarcely one-third wider than long, feebly convergent and nearly straight at the sides to apical fourth, then abruptly, strongly narrowed and tubulate, the apex truncate and fully two-thirds as wide as the base, the latter transverse, the median lobe small and rather feeble, rounded; disk with a very narrow, incomplete and subobsolete impunctate line, the punctures nearly as in *cribrata*, but rather closer. *Elytra* one-fourth wider than the prothorax and nearly two and one-half times as long, the humeri feebly tumid, not prominent laterally; sides parallel and feebly arcuate; apex gradually, rather narrowly parabolic; disk with somewhat narrow, moderately deep striæ, becoming coarser and somewhat crenulate near the base, the intervals flat, from one-half wider than, to nearly twice as wide as, the grooves, the punctures arranged in nearly even single series, fine and remote but becoming very coarse and rather close-set toward base, more or less confused on the third. Length 3.2 mm.; width 1.25 mm.

#### New Mexico (Las Vegas).

Closely allied to *cribrata*, but well distinguished by its much narrower and more convex form, less truncate elytra, more elongate prothorax, and especially by the much longer, still more robust and

whiter setæ, without trace of condensed spots. In *cribrata* the third interval is not only more densely setulose, but appears also to be feebly elevated toward base.

### **TREPOBARIS** n. gen.

The single species representing this genus is narrow, elongate-oval and subcylindrical in form, resembling somewhat a very elongate *Aulobaris*, and perhaps really allied more closely to that genus than to any other. The prothorax is more elongate and parallel than in *Aulobaris*, and is briefly tubulate at apex, and in antennal structure it differs from the genus in question by its normally short second funicular joint and longer club, and in tarsal structure by the much smaller third joint, not wider than long though distinctly wider than the preceding.

As in *Pseudobaris*, the prosternum is very deeply and abruptly sulcate, the sulcus being much too narrow to receive the beak, and this is another important feature distinguishing it from *Aulobaris*. The sulcus is of somewhat peculiar form, being moderately and gradually dilated anteriorly and narrowest at a point just before the coxæ, a contour which suggests a line of development parallel with that of *Aulobaris naso*.

1 **Trepobaris elongata** n. sp.—Elongate, subcylindrical, convex, highly polished and deep black throughout, the setæ of the upper surface excessively minute, the third elytral interval without trace of squamules at base; setæ of the under surface very small, erect. *Head* convex, finely, sparsely punctured, the transverse impression strong, obtusely angulate in profile; beak rather stout, sparsely punctate, rather strongly arcuate at the base, but feebly so thence to the apex, equal in length to the head and prothorax in the male; antennæ moderately slender, the basal joint of the funicle long, the second not twice as long as wide, scarcely one-half as long as the first and much shorter than the next two, the club rather large, oval, densely pubescent, as long as the five preceding joints together and with its basal joint constituting but little more than one-third of the mass. *Prothorax* very nearly as long as wide, the sides just visibly convergent and nearly straight to apical fourth, then broadly rounded and feebly convergent to the fine apical constriction, the apex very briefly tubulate, truncate and fully three-fifths as wide as the base, the latter transverse, the median lobe almost completely obsolete; disk not very coarsely punctate, without impunctate line, the punctures scarcely one-third as wide as the scutellum and separated by fully their own diameters toward the middle, close but not rugulose at the sides. *Scutellum* moderate, transverse, broadly angulate behind. *Elytra* at base equal in width to the prothorax, fully twice as long as the latter, three-fourths longer than

wide, the humeri very small, rectangular, feebly tumid, not prominent laterally; sides very feebly convergent and just visibly arcuate from the base nearly to the apex, then rather suddenly and semi-circularly rounded; disk with somewhat fine but deep grooves, the intervals flat, nearly three times as wide as the striæ, equal, each with a single series of minute but deep distinct rounded and very remote punctures. *Abdomen* rather sparsely punctured. Prosternum separating the moderately small coxæ by fully their own width. Length 3.1–4.2 mm.; width 1.15–1.5 mm.

Texas.

The type described above is a male and has a narrow elongate and distinct, but not very deep, impression near the base of the abdomen. The fifth ventral segment is broadly sinuato-truncate and one-half longer than the fourth.

**GLYPTOBARIS** n. gen.

The single species forming the type of *Glyptobaris* possesses many of the generic characters of *Onychobaris*, but differs in sculpture and vestiture to a marked degree and inhabits a different geographical region. It resembles *Onychobaris* in the structure of the beak and antennæ and especially in the remote anterior coxæ and broad flat prosternum, but differs distinctly in the form and extent of the post-coxal parts of the prosternum, and also, somewhat, in the structure of the mandibles. The latter are acute at apex and come together along a crenulate line, but do not at all overlap in repose; they are straight in external outline, not at all arcuate, and when closed form an isosceles triangle.

The broad prosternum has, anteriorly, two small deep foveæ, widely distant, arranged transversely, and connected by a very narrow deep and abrupt groove; from each there extends posteriorly for a considerable distance a fine deep inwardly arcuate groove, the two being strongly convergent, the triangular space so inclosed being flat and impunctate. Just behind the coxæ, before the posterior margin of the broad prosternal process, there are two distant strongly elevated transverse tubercles, of which no trace can be seen in any species of *Onychobaris*, but which evince an unmistakable relationship with *Madarellus* as shown under that genus.

The pygidium is vertical and partially covered above by the overhanging tips of the elytra, somewhat as in *Desmoglyptus*.

1 ***Glyptobaris rugicollis*** Lec.—Proc. Am. Phil. Soc., XV, p. 297 (*Onychobaris*).

Oval in form, strongly convex, rufo-piceous and polished. The



head is not punctate but minutely granulato-reticulate and dull, the beak rather robust, very strongly arcuate and a little longer than the prothorax, densely, coarsely punctured at the sides. The prothorax is nearly one-third wider than long, with the sides evenly and broadly rounded, becoming parallel near the base, the apex not constricted but sometimes with a short prominent carina on the sides at the apical margin, the base transverse and with a very small but prominent median lobe, the disk coarsely, deeply, very densely sculptured in longitudinal irregularly vermiculate rugæ, which are in some spots broken up into coarse punctures, and having a fine, more or less prominent, subentire median carina. Scutellum very small, ogival and not transverse. The elytra are strongly narrowed from base to apex, three-fourths longer and but slightly wider than the prothorax, the apex narrowly subtruncate, the disk with rather fine but deep and abrupt, remotely crenulate striæ, the intervals flat, wide, finely sparsely and unevenly punctate, the yellowish elongate scales forming a large quadrate spot in basal three-fifths, the most prominent feature in the pattern being two transverse bands, each consisting of two uneven lunules; elsewhere the vestiture is very sparse and inconspicuous. Length 3.6–4.3 mm.; width 1.7–2.0 mm.

Somewhat abundant throughout the eastern and southern Atlantic States. The specimens before me are from Indiana, Pennsylvania, District of Columbia and North Carolina.

### ONYCHOBARIS.

LeConte—Proc. Am. Phil. Soc., XV, p. 294.

The species of this genus are characterized in general by their excessively densely punctured, rather dull integuments, although there are numerous exceptions having the sculpture as sparse as in *Baris*. *Onychobaris* is a widely distinct and somewhat extensive genus, almost exclusively restricted to the desert regions of the southwest, where it replaces *Baris* in great measure; at least one species extends as far to the eastward as the Mississippi River and another is known from the true Pacific fauna, but the focal centre of the genus undoubtedly lies in the dry regions of Arizona and New Mexico.

The vestiture consists of short robust semi-erect setæ as in *Baris*, but is often so abundant, from the density of punctuation, as to give to the surface a grayish-pruinose appearance. The generic characters are stated at sufficient length in the table, and there are

but few special peculiarities to which it is necessary to call attention at present; one of these is, however, possibly of considerable significance from an etiological point of view, and relates to the modified impression of the prosternum. The prosternum is greatly developed, rather remotely separating the coxæ, and almost perfectly flat, but, in the middle, at some distance behind the anterior margin, there are two deep punctiform foveæ, moderately separated and arranged transversely. These foveæ are generally connected by a groove, and sometimes form the anterior limit of a more or less visible but feeble short parallel-sided impression. A still more advanced development of this peculiar modification of the remnant of the rostral sulcus, has been described under the genus *Glyptobaris*.

In *Onychobaris* the beak is decidedly longer than in *Baris*, being generally a little longer than the prothorax, and is always strongly arcuate and more or less slender; it is separated from the head by a transverse impression, which is always feeble and invariably abruptly impunctate and polished. The tarsi vary considerably in structure, the last joint being frequently as long as the first three together but generally shorter. The scutellum is transverse, never impressed, and usually more or less broadly rounded behind. The male sexual characters are feeble, the abdominal impression being invariably slight and often scarcely distinguishable.

It is to be regretted that the majority of the species are still represented by unique examples, and there is consequently reason to believe that the following table contains only a small proportion of the forms inhabiting the inhospitable and comparatively unexplored regions which have developed this interesting special type.

Pronotum extremely densely punctured, only rarely with trace of median impunctate line, which is then much abbreviated .....	2
Pronotum less densely punctured, generally with a distinct impunctate line, entire or abbreviated, but at least occupying one-half of the total length .....	10
<b>2</b> —Elytral punctures more or less broadly confused on all the intervals; body generally broader and more oblong or subrhomboidal .....	3
Elytral punctures forming nearly even single series on all the intervals; body more narrowly oval and convex .....	6
<b>3</b> —Legs, and sometimes also the beak, more or less rufescent .....	4
Legs and beak intense black throughout .....	5
<b>4</b> —Body not strongly depressed, the setæ moderately dense but not very long or robust.	
Pronotal punctures coarse, usually with a distinct but very narrow and incomplete impunctate line .....	1 <b>densa</b>

Pronotal punctures much smaller, the median line totally obsolete.

**2 corrosa**

Body strongly depressed, roughly sculptured, the elytral setæ long, very robust, dense and conspicuous.....**3 depressa**

**5**—Prosternum feebly impressed along the middle, the anterior coxæ separated by but slightly more than their own width; large species, with very large prothorax, the latter nearly as long as wide, the elytra relatively short, the beak stout.....**4 millepora**

Prosternum flat, the anterior coxæ smaller and more remote.

Punctures of the elytral intervals broadly confused throughout.

Elytral setæ coarse, long and conspicuous but not very dense.

**5 austera**

Elytral setæ very small, slender and only noticeable because of their greater abundance.....**6 insidiosa**

Punctures of the elytral intervals moderate in size, broadly confused only toward base, forming single series toward apex.....**7 subtonsa**

**6**—Elytral punctures larger, distinct and generally close-set; intervals narrow; body less slender.....**7**

Elytral punctures very minute and remote, the intervals wide, flat.....**9**

**7**—Body, legs and beak intense black throughout; small species...**8 arguta**

Legs and beak rufous, the entire body also frequently more or less rufo-piceous.....**8**

**S**—Body rufo-ferruginous, the elytra black, smoother, with alutaceous lustre, the interstitial punctures rather less coarse and separated by about their own diameters.....**9 audax**

Body unicolorous throughout, black or more or less rufo-piceous; interstitial punctures always coarse, deep and occupying the entire width of the intervals or very nearly.

Larger species, the prothorax nearly as long as wide and the elytra relatively shorter.

Surface strongly shining, black.....**10 stictica**

Surface opaque from the extreme density of the sculpture; body dark blackish-piceous in color.....**11 mystica**

Small species, the prothorax distinctly transverse.

Elytral setæ very small and inconspicuous; legs and beak pale rufous.

**12 egena**

Elytral setæ longer, conspicuous; legs and beak darker, piceo-rufous, the former a little shorter.

Sides of the prothorax parallel; elytral setæ erect, bristling, those of the stria punctures almost as long as the others.....**13 ambigua**

Sides of the prothorax feebly divergent from the base; elytral setæ shorter, more inclined, more distant and less conspicuous; those of the stria punctures very small and scarcely at all visible.

**14 pauperella**

**9**—Body narrow, parallel; very small species.....**15 seriata**

**10**—Elytral intervals wider than the stria.....**11**

Elytral intervals not wider than the grooves.....**14**

- 11**—Intervals remotely punctured .....12  
 Intervals more approximately punctured .....13
- 12**—Intervals but slightly wider than the grooves, the punctures coarse and more noticeably remote on the alternate intervals; pronotal punctures coarse and separated by rather less than their own widths, the surface feebly alutaceous .....16 **remota**  
 Intervals rather more than twice as wide as the striæ, the punctures small and remote on all; pronotum dull and strongly granulato-reticulate, the impunctate area wide, the punctures smaller and separated by much more than their own diameters .....17 **distans**
- 13**—Larger species, the elytral humeri very distinctly tumid and prominent. Form moderately broad, the elytra distinctly longer than wide; legs rufous. Punctures of the elytral intervals large, rounded, very deep and close-set, forming single series; prothorax sometimes slightly inflated.  
 18 **molesta**  
 Punctures of the elytral intervals smaller, more distant, uneven in size and shape, forming single series on some and finer and broadly, sparsely confused on others .....19 **illex**  
 Form very broad, the elytra not longer than wide and strongly narrowed from base to apex; legs black, with a feeble piceous tinge.  
 20 **pectorosa**
- Rather small species, less than 3 mm. in length, the elytral humeri feebly and obsoletely tumid, not at all prominent.....21 **diluta**
- 14**—Elytral grooves extremely coarse, the interstitial punctures very coarse and semi-coalescent; form broad; antennæ aberrant .....22 **porcata**

**1 Onychobaris densa** Lec.—Proc. Acad. Nat. Sci. Phila., 1859, p. 79; *ibid.*, 1868, p. 362 (Baridius); Proc. Am. Phil. Soc., XV, p. 295.

The form in this species is oblong-oval and convex, the integuments densely and deeply sculptured and but feebly shining, and the setæ silvery and somewhat conspicuous. The beak is rather slender, strongly arcuate toward base but becoming straight in apical half, and is slightly longer than the prothorax; the second joint of the antennal funicle is one-half longer than the third. The prothorax is scarcely two-fifths wider than long, the sides feebly convergent and nearly straight to apical fourth, then strongly rounded, the apex briefly tubulate; punctures somewhat coarse and very deep, one-half as wide as the scutellum, very densely and polygonally crowded. The elytra are but slightly longer than wide and about two-thirds longer than the prothorax, the striæ rather coarse and deep, the intervals flat, alternately wide and narrow, somewhat coarsely, deeply, extremely densely and confusedly punctate and rugulose but strongly shining. The abdomen is coarsely,



deeply and rather closely punctured toward base. Length 3.2–3.7 mm.; width 1.4–1.75 mm.

The series before me was collected by Mr. G. W. Dunn, at San Diego, California, from which locality it was originally described.

Mr. H. C. Fall of Pomona, Cal., writes me that this species is found at Coronado, immediately opposite San Diego on the line of the seabeach, where it "frequents the flowers of a low fleshy-leaved plant just above the beach." Mr. Fall states further that he has "taken it in the flowers in July and in the sand beneath the plants in February," and also remarks that in every specimen taken by him "the legs, and beak to some extent, incline to paleness." It may be concluded from these statements that *densa* is confined in distribution to the immediate seashore of Southern California.

**2 *Onychobaris corrosa* n. sp.**—Oblong-oval, convex, black, the head, beak and legs piceous; integuments opaque from extreme density of sculpture. *Head* finely but strongly, densely punctured for a short distance behind the transverse polished and impunctate interocular impression, which is normally feeble; beak thick, not sensibly tapering, rather strongly, evenly arcuate, very densely punctate, the fine median impunctate line obliterated toward base, equal in length to the prothorax; antennæ moderate, the second funicular joint fully one-half longer than the third. *Prothorax* about one-third wider than long, the sides straight and parallel in basal two-thirds, then broadly rounded and convergent to the apex, which is only feebly constricted; base broadly bisinuate, the median lobe more prominent than the sides, rather narrowly rounded at apex and broadly cuspiform; disk without distinct trace of median line, the punctures moderately small, fully one-third as wide as the scutellum, deep and throughout extremely dense and polygonally crowded. Scutellum rather small, transverse. *Elytra* slightly longer than wide, nearly three-fourths longer than the prothorax, and, at the feebly prominent humeri, slightly wider than the latter; outline behind the humeri evenly hemi-elliptical; disk with rather coarse deep grooves, the intervals nearly flat, subequal, about one-half wider than the grooves and rather coarsely, deeply, extremely densely and confusedly punctate throughout, somewhat coarsely rugulose, the setæ distinct but sparse, short, subrecumbent and rather robust, those at the bottom of the grooves as large and distinct as the others. *Abdomen* finely, rather closely punctured. Length 3.9 mm.; width 1.8 mm.

Colorado.

The unique type is apparently a female, and the species is quite distinct from any other here noted.

**3 *Onychobaris depressa* n. sp.**—Oblong-oval, depressed, black, the legs rufo-piceous; setæ rather short but erect and hispid, broad and sub-squamiform, abundant, cinereous and conspicuous. *Head* coarsely, very

densely punctured and hispid, divided from the beak by a feeble, shining and impunctate impression, the beak rather slender, strongly, evenly arcuate, not quite as long as the prothorax, densely and coarsely, rugosely sculptured; antennæ nearly normal but with the basal joint of the club composing fully one-half of the mass, the second funicular joint one-half longer than the third, the setæ robust. *Prothorax* one-third wider than long, the sides subparallel and nearly straight in basal three-fourths, then strongly rounded and convergent to the apex which is slightly constricted; base transverse, the median lobe rather small but prominent; disk without trace of impunctate line, but very narrowly and vaguely subcarinate along the middle, the sculpture uneven and excessively dense, consisting of closely crowded, rather coarse, very deep punctures, about one-half as wide as the scutellum, the latter small, moderately transverse, opaque. *Elytra* a little longer than wide, nearly four-fifths longer than the prothorax, and, at the base, rather abruptly and quite distinctly wider than the latter, the humeri but feebly tumid; outline thence around the apex hemi-elliptical; disk with moderately fine, not very deep but abrupt striæ, the intervals wide, flat, alternating from two to three times as wide as the striæ, finely and feebly, not very densely but unevenly and confusedly punctate and strongly shining. *Abdomen* densely punctured toward the sides and base, but sparsely so toward the middle of segments two to four. Prosternum perfectly flat behind the transverse apical constriction, and very widely separating the coxæ. Length 3.3 mm.; width 1.6 mm.

California (Santa Monica). Mr. Jülich.

A remarkably distinct species, to be known at once by the coarsely, extremely densely sculptured and subopaque pronotum, head and beak, and rather shining, finely but unevenly punctured elytra, also by the strongly depressed body and coarse erect and robust setæ. The antennal club resembles that of *Baris* in form but is densely pubescent throughout. The unique type is a male.

**4 *Onychobaris millepora* n. sp.**—Oblong, feebly rhomboidal, convex, rather dull in lustre and grayish-black throughout, the setæ small but abundant and very distinct. *Head* rather strongly punctured but only near the anterior margin, separated from the beak by an extremely feeble transversely impunctate and polished impression; beak rather robust, tapering from base to apex, strongly, evenly arcuate and not quite as long as the prothorax; antennæ moderate, the second funicular joint unusually long, not quite twice as long as wide but subequal to the next two; club normal, with its second joint three-fourths as long as the first. *Prothorax* very large, just visibly wider than long; sides feebly convergent and nearly straight to apical fourth, then strongly arcuate and convergent to the apex, the latter not distinctly constricted; base transverse, the median lobe large and well developed, rounded; disk with very narrow, short and ill-defined impunctate line near the centre; punctures very small but deep, rounded and in rather close contact throughout, about one-fourth as wide as the scutellum. *Elytra* but just

visibly longer than wide, about one-third longer than the prothorax, and, at the small and slightly prominent humeri, but little wider than the latter; sides distinctly convergent, the apex parabolic; disk very finely striate, the striæ deep, abrupt, impunctate, the intervals flat, alternating slightly in width, four or five times as wide as the striæ, finely, deeply, closely and confusedly punctured throughout but not rugose. *Abdomen* finely, rather densely punctate. Prosternum widely separating the coxæ, the latter not quite as small as usual. Length 4.7 mm.; width 2.25 mm.

New Mexico; Colorado.

The type is probably a male, the middle of the abdomen near the base being very feebly impressed, and abruptly more coarsely and very sparsely punctured.

This exceedingly isolated species may be known at once by its very finely and densely punctured integuments, rather large size, feebly rhomboidal form, large prothorax and short conical elytra. As is frequently the case in this genus, the prothorax in some specimens becomes feebly inflated, especially toward apex, a form which is however constant and distinctive in some species.

5 ***Onychobaris austera*** n. sp.—Moderately robust, rhomboid-oval not very convex, black throughout, very densely sculptured, the setæ cinereous, robust and conspicuous but not dense. *Head* rather finely, deeply, very densely punctate, the transverse impression feeble, indicated by a narrow polished and abruptly impunctate line; beak densely, rugosely punctate, setulose, rather stout and broadly, evenly arcuate in basal half, becoming straight and slightly tapering thence to the apex, very nearly as long as the head and prothorax; antennæ inserted at the middle, moderately slender, the basal joint of the funicle fully as long as the next three, second obconical, but slightly longer than wide, three to seven transverse, club oval, pubescent, with the basal joint large. *Prothorax* two-fifths wider than long, the sides feebly but distinctly convergent and straight from the base to apical third, then gradually, evenly rounded and convergent to the small but evident sub-apical constriction, the apex transversely truncate and much less than one-half as wide as the base, the latter transverse, the lobe constituting a little more than one-third of the entire width, rounded and prominent; disk very deeply and densely punctate, without trace of impunctate line, the punctures somewhat coarse. Scutellum moderate. *Elytra* at the small but prominent humeral callus much wider than the prothorax, three-fourths longer than the latter, a little longer than wide, broadly hemi-elliptical in outline; disk with distinct but not very deep striæ, the intervals flat, slightly unequal, about twice as wide as the grooves, coarsely, confusedly, closely and rugosely punctured throughout but shining. *Abdomen* rather coarsely and deeply punctate, the punctures well separated. Prosternum flat, the coxæ very remote. Length 3.3 mm.; width 1.7 mm.

California (San Diego). Mr. Ch Fuchs.

Allied to *densa* but differing radically in its black legs, much smaller and still more dense pronotal punctures, without trace of the median impunctate line usually quite distinct in that species, and with much coarser and more conspicuous setæ. It also resembles *depressa*, but is much less depressed, as can be readily seen in profile, and has the body more rhomboidal; the subsquamiform setæ are not so coarse and are less dense.

6 ***Onychobaris insidiosa*** n. sp.—Oblong-oval, moderately convex, subopaque, grayish-black throughout, the setæ very short. *Head* finely, closely punctate anteriorly, limited by a transverse impunctate line; beak very densely, finely but strongly punctate, with a fine dorsal impunctate line, strongly arcuate, distinctly tapering from base to apex, very slightly longer than the prothorax; antennæ slender, the second funicular joint longer than wide and nearly one-half longer than the third. *Prothorax* about two-fifths wider than long, nearly as in *densa* but with the punctures much smaller, fine, deep, nearly in mutual contact but not polygonally compressed, rather more than one third as wide as the scutellum. Scutellum small, transverse, not distinctly impressed. *Elytra* nearly one-fourth longer than wide, quite distinctly less than twice as long as the prothorax, and, at the moderately prominent humeri, slightly wider than the latter; sides feebly convergent, the apex semi-circular; disk with moderately coarse, deep, abrupt, irregularly punctate striæ, the intervals flat, alternating somewhat in width, the wider about twice as wide as the grooves, all finely, densely, unevenly and subrugulose punctured. *Abdomen* shining, finely, not very strongly or densely punctured. Prosternum flat, the coxæ rather small, separated by one-half more than their own width. Length 2.3–3.3 mm.; width 1.1–1.6 mm.

Western Texas (Big Springs)—Mr. H. F. Wickham; Southern California.

A rather small, extremely densely and somewhat finely sculptured, subopaque species, allied to *densa*, but differing in the much finer punctures of the pronotum, smaller size and somewhat broader form. Thirteen specimens.

7 ***Onychobaris subtonsa*** Lec.—Proc. Am. Phil. Soc., XV, p. 295.

Oval, rather strongly convex and shining, black throughout, the setæ distinct. The beak in the female is strongly and almost evenly arcuate, not distinctly tapering from base to apex and is slightly longer than the prothorax, the second funicular joint one-half longer than the third. The prothorax is barely one-fourth wider than long, the sides very feebly convergent and almost straight nearly to the apex, then strongly rounded and distinctly constricted, the



punctures small, deep, circular, scarcely one-third as wide as the scutellum and not quite in actual contact, although very dense. The elytra are quite distinctly longer than wide, fully two-thirds longer than the prothorax, and the sides behind the humeri are decidedly convergent, the apex being somewhat narrowly semi-circular; the striae are not very coarse or deep but abrupt, the intervals flat, subequal in width, each rather more than twice as wide as the grooves and not very coarsely punctured, the punctures forming almost even single rows, but broadly confused on the fifth throughout and on all toward base. The anterior coxæ are remote and the abdomen rather sparsely punctured. Length 2.6–3.8 mm.; width 1.2–1.6 mm.

Texas, Kansas and Colorado. Easily distinguishable from the species allied to *densa*, by the subserial arrangement of the interstitial punctures and the more elongate form.

8 ***Onychobaris arguta*** n. sp.—Oblong-oval, rather strongly convex, shining, black throughout, the setæ very small, slender and inconspicuous. *Head* finely, rather sparsely punctate, the impression feeble, polished; beak rather stout, evenly cylindrical and arcuate throughout, densely, deeply, not coarsely but rugosely punctate and quite distinctly shorter than the prothorax; antennæ rather slender, inserted just behind the middle, the first funicular joint fully as long as the next three, the second obconical, one-half longer than wide, three to seven feebly transverse, the former nearly as long as wide. *Prothorax* one-third wider than long, the sides parallel and nearly straight to apical fourth, then rather abruptly, strongly rounded, thence convergent and feebly sinuate to the apex; base transverse, broadly bisinuate; disk rather convex, evenly, closely, not finely punctate, the punctures rounded, deep, about two-fifths as wide as the scutellum and generally separated by about one-half of their own diameters; impunctate line obsolete. Scutellum rather small. *Elytra* slightly wider than the prothorax and from one-half to three-fifths longer, distinctly longer than wide, hemi-elliptical, the humeri moderately prominent; striae not very coarse, somewhat shallow but abrupt, the intervals slightly unequal, generally nearly twice as wide as the grooves, flat, smooth, each with a single series of deep punctures which are moderately large and rather distant, but becoming coarse and close-set toward base. *Abdomen* rather finely but strongly punctate. Prosternum flat, the anterior coxæ rather large, separated by one-fourth more than their own width. Length 2.65–2.8 mm.; width 1.2–1.3 mm.

California (foot-hills of the southern sierras). Mr. H. C. Fall.

This species is not closely related to any other but should be associated with *audax*; it differs from *ambigua* and *egena* in its black legs and in several other characters as stated in the table. In general form it somewhat resembles *pauperella*.

9 **Onychobaris audax** n. sp.—Oblong, strongly convex, shining, the elytra feebly alutaceous, brownish rufous throughout, the elytra blackish, setæ very small, distant and forming even single lines on the elytra. *Head* toward apex and beak finely but densely punctate, the latter moderately slender, evenly, somewhat strongly arcuate and rather longer than the prothorax; antennæ slender, second funicular joint but little longer than the third. *Prothorax* about one-fourth wider than long, the sides straight and somewhat divergent from the base to apical fourth, then strongly rounded and subprominent, thence very strongly convergent to the apex which is minutely and visibly constricted; base transverse, the median lobe rather narrow but prominent, rounded, constituting less than one-third of the width; disk with but the feeblest traces of a short median line, the punctures very deep, moderately small, one-third as wide as the scutellum, very dense, almost in mutual contact but circular and not polygonally crowded. Scutellum moderate, transverse. *Elytra* about one-fifth longer than wide, two-thirds longer than the prothorax, and, at the small feebly tumid humeri, but just visibly wider than the disk of the latter; sides for a short distance behind the humeri parallel, then elliptically rounded through the apex; disk with rather narrow, deep and finely, remotely but distinctly punctate grooves, the intervals flat, subequal, about twice as wide as the grooves, each with a single series of somewhat small, feeble, rather remote and subtransverse punctures, slightly confused toward base especially on the fifth. *Abdomen* rather finely, not densely punctured. Length 3.0 mm.; width 1.4 mm.

California (southern).

A small and easily recognizable species, having the prothorax rather wider at apical fourth than at base, and with the sides straight. It is also somewhat aberrant in coloration.

10 **Onychobaris stictica** n. sp.—Oblong, not very robust, strongly convex, black, the head and beak feebly rufescent, the legs paler, rufous; integuments polished, moderately densely sculptured. *Head* finely, sparsely punctured, the punctuation obsolete toward base, the feeble transverse impression broadly impunctate and polished; beak moderately stout, rather feebly, evenly arcuate, fully as long as the prothorax, strongly, densely punctate, with a narrow impunctate and subcarinate median line; antennæ normal, the second funicular joint slightly longer than the third. *Prothorax* rather elongate, scarcely one-fourth wider than long, the sides parallel and nearly straight to apical fourth, then broadly, evenly rounded and strongly convergent to the apex, which is quite distinctly constricted; base transverse, the median lobe very broad, distinct; disk without distinct trace of median line; punctures rather small, circular, deep, dense but not quite in actual contact and scarcely one-fourth as wide as the scutellum. Scutellum well developed, transverse. *Elytra* one-fifth longer than wide, one-half longer than the prothorax, at the feebly tumid humeri but just visibly wider than the latter, the sides thence feebly convergent and nearly straight to the apex, the latter semi-circularly rounded; disk with rather coarse abrupt and moderately deep

grooves; the intervals flat, subequal, not quite one-half wider than the grooves, each with a single series of large deep rounded and close-set punctures which occupies nearly its entire width; setæ rather long, conspicuous. *Abdomen* polished, rather coarsely strongly and moderately closely punctured. *Legs* moderate; basal joint of the tarsi as long as the next two, the third small, but slightly wider than the second, the fourth much shorter than the three preceding together; claws small. Prosternum very widely separating the coxæ. Length 3.3 mm.; width 1.6 mm.

Arizona (Benson). Mr. G. W. Dunn.

Somewhat similar to *subtonsa* in general outline, but in scarcely any other character. The setæ of the elytra in *subtonsa* are very small, subrecumbent and not conspicuous, while in *stictica* they are unusually long, erect and form even bristling single series on each interval; the indistinct punctures of the grooves also bear smaller setæ which are, however, visible under moderate power. The punctures of the pronotum are a little less dense along the middle.

11 ***Onychobaris mystica*** n. sp.—Oblong-oval, convex, extremely densely sculptured, opaque, piceous-black, the head, beak and legs rufous, the setæ short but erect, rather stout, distinct and somewhat dense. *Head* strongly, densely punctate toward apex, the transverse groove distinctly impressed and very highly polished, abruptly impunctate, the beak moderately densely punctate, very densely so at the sides, the median impunctate line distinct and entire, strongly, evenly arcuate, equal in length to the prothorax in the male, quite distinctly longer in the female; antennæ moderate, the second funicular joint rather long, scarcely twice as long as wide but subequal to the next two. *Prothorax* rather long, scarcely one-fourth wider than long, the sides subparallel in basal three-fourths, then strongly rounded and convergent to the apex which is broad, truncate and distinctly constricted at the sides; base subtransverse, the median lobe large, rather more than one-third the total width, prominent, broadly rounded; disk without trace of median line, the punctures moderately coarse, nearly two-fifths as wide as the scutellum, deep, excessively dense and polygonally crowded throughout. Scutellum rather small. *Elytra* a little longer than wide, barely one-half longer than the prothorax, and, at the small but distinctly prominent humeri, quite noticeably wider than the latter; outline behind the humeri broadly hemi-elliptical; disk with abrupt deep coarse and confusedly punctured grooves, the intervals flat, narrow, subequal, exactly equal in width to the grooves and each with a single series of large, very deep, circular, perforate and very close-set punctures, which are almost as wide as the intervals. *Abdomen* rather coarsely, densely punctured. Length 3.3–4.1 mm.; width 1.4–1.9 mm.

Arizona (Benson and Pinal Mts.)—Dunn and Wickham; Texas (El Paso), Mr. Dunn.

Very easily separated from either *pauperella* or *ambigua*, which

it somewhat resembles in general outline, by its coarser and still more closely crowded and opaque sculpture, coarser, deeper, more perforate and much more even interstitial punctures, coarser grooves and narrower intervals, and by its decidedly larger size. It is represented by a series of nine specimens, exhibiting scarcely any variation.

12 **Onychobaris egena** n. sp.—Oblong-oval, convex, very densely sculptured but rather strongly shining, black, the prothorax beneath with a piceous tinge; head, beak and legs bright red; setæ small, sparse and inconspicuous; those arising from the punctures of the elytral striæ about as long as those of the intervals. *Head* shining, rather finely, deeply punctured, the punctures separated by about their own widths; impression rather strong; beak somewhat stout, evenly, moderately arcuate, feebly tapering toward apex, shining, rather coarsely, deeply but not very densely punctate, about as long as the head and prothorax; antennæ inserted at the middle, the basal joint of the funicle scarcely as long as the next three, second fully three-fourths longer than wide, third to seventh increasing in width, the former nearly as long as wide, the latter strongly transverse, club rather small and narrow, not abrupt. *Prothorax* one-fourth wider than long, the sides straight and just visibly divergent from the base to apical third, then broadly rounded to the small but distinct constriction; apex very briefly tubulate, truncate and distinctly more than one-half as wide as the base, the latter rather deeply bisinuate; disk without trace of impunctate line, deeply, rather coarsely and extremely densely punctate, the punctures three-fifths as wide as the scutellum, rounded but in mutual contact. Scutellum slightly transverse. *Elytra* short, scarcely visibly wider than the prothorax and about one-half longer, but slightly longer than wide, parabolic in outline, the humeri very slightly prominent; disk coarsely, deeply striate, the intervals subequal, narrow, not distinctly wider than the grooves, each with a single even series of very coarse deep rounded and close-set punctures. *Abdomen* deeply, rather coarsely, moderately closely punctured. Prosternum narrowly and just visibly impressed in the middle, the coxæ moderate, remote, separated by much more than their own width. Length 2.7 mm.; width 1.2 mm.

Arizona (Pinal Mts.). Mr. H. F. Wickham.

A small species belonging to a group in which the species become rather closely allied. It perhaps approaches *pauperella* more nearly than any other form here noted, but differs in its shorter elytra, with smaller and less conspicuous setæ and much coarser more close-set interstitial punctures, and also in the coarser punctures of the head and pronotum. From *ambigua* it differs in its smaller size, narrower form, much shorter, less visible setæ and narrower, more coarsely, closely and evenly punctured intervals.



13 **Onychobaris ambigua** n. sp.—Oblong, convex, piceous-black and rather dull throughout, the head, beak and legs obscurely rufescent; sculpture very dense; setæ rather long, erect, forming conspicuous bristling series on the elytra. *Head* near the apex and beak finely but strongly, very densely punctured, the transverse impression feeble and only narrowly and imperfectly impunctate; beak rather slender, evenly, strongly arcuate, scarcely at all tapering, equal in length to the prothorax, the median subcariniform line almost obsolete; antennæ moderate, the second funicular joint fully one-half longer than the third. *Prothorax* scarcely more than one-fourth wider than long, the sides parallel and straight nearly to apical fourth, then evenly, strongly rounded but not prominent, thence strongly convergent and nearly straight to the apex which is not distinctly constricted; base transverse, straight, the median lobe rather small but rounded and prominent; disk with barely a trace of an impunctate line, rather finely, deeply, extremely densely punctate throughout, the punctures scarcely one-third as wide as the scutellum, circular and not polygonally distorted. Scutellum moderate. *Elytra* not longer than wide, barely two-fifths longer than the prothorax, and, at base, rather abruptly a little wider than the latter; outline thence hemi-elliptical; disk with not very coarse, moderately deep striæ, the intervals flat, subequal, nearly twice as wide as the striæ, not very coarsely but deeply, closely punctate, the punctures forming somewhat uneven single series on each. *Abdomen* moderately closely punctured. Length 2.8–3.0 mm.; width 1.35–1.6 mm.

Arizona.

A somewhat small species, closely allied to *pauperella*, but easily distinguishable by its larger size and more robust form, also by its shorter elytra, not only actually but relatively to the prothorax; the sides of the latter are parallel in basal three-fourths in this species, but feebly convergent toward base in basal two-thirds in *pauperella*, the widest part of the disk in the latter being at apical third. The prothorax is longer in *ambigua*, and the elytral intervals wider. It is represented by four specimens, one of which is contained in the collection of the National Museum, and was probably collected by Mr. Morrison.

14 **Onychobaris pauperella** n. sp.—Oblong, suboval, convex, feebly shining, black, the head, beak and legs dark rufo-piceous; setæ moderately long, distinct and forming rather conspicuous single series on the elytra. *Head* finely, rather sparsely punctate toward apex, the beak densely punctured at the sides, rather thick, equal in length to the prothorax, feebly tapering from base to apex, evenly and strongly arcuate; antennæ moderate, the second funicular joint but slightly longer than the third. *Prothorax* nearly one-third wider than long, the sides feebly divergent and nearly straight to apical third, then gradually broadly rounded and convergent to the apex, which is minutely and scarcely visibly constricted; base transverse and

straight, the median lobe small but prominent, broadly rounded; disk slightly wider at apical third than at base, evenly, strongly convex, without trace of median line, the punctures rather small but deep, one-third as wide as the scutellum, very dense and even throughout but circular and not in actual contact. Scutellum moderate. *Elytra* about one-fifth longer than wide, one-half longer than the prothorax, and, at the rather small but somewhat prominent humeri, quite distinctly wider than the latter; outline behind the humeri hemi-elliptical, the sides distinctly convergent: disk coarsely, deeply striate, the intervals sometimes feebly alternating in width, slightly, to fully one-half, wider than the grooves, each with a single somewhat uneven series of coarse, deep, close-set and subrugulose punctures. *Abdomen* moderately closely punctured. Prosternum separating the rather large coxæ by one-fourth more than their own width. Length 2.3–2.8 mm.; width 1.0–1.2 mm.

#### Arizona.

This is one of the smallest species of the genus, somewhat resembling *audax* in outline, but with narrower, much more coarsely closely and roughly punctured elytral intervals, and differing also in its entirely black body and more broadly rounded sides of the prothorax anteriorly. Four specimens.

15 ***Onychobaris seriata*** Lec.—Pac. R. R. Expl. and Surv., Ins., p. 58; Proc. Ac. Nat. Sci., Phila., 1868, p. 363 (Baridius); Proc. Am. Phil. Soc., XV, p. 296.

The smallest species of the genus and very distinct from any other which I have observed. It is unusually narrow and parallel, moderately convex, black and polished, the beak rather robust, moderately and evenly arcuate and slightly longer than the prothorax, the antennæ normal in structure, the basal joint of the funicle not as long as the next four and the second but very slightly longer than the third. The prothorax is nearly as long as wide, parallel on the sides to apical fourth, then broadly rounded and convergent to the apex, which does not appear to be at all constricted; there is but feeble trace of a short median line and the punctures are deep, about one-third as wide as the scutellum and separated by nearly their own widths toward base, but nearly contiguous toward apex. The elytra are much longer than wide and about two-thirds longer than the prothorax, finely but deeply and abruptly striate, the intervals flat, subequal, about three times as wide as the grooves and each with a single series of very minute distant punctures, each bearing a scarcely distinguishable seta; the striæ become quite coarsely crenulate very near the base. Length 2.3 mm.; width 0.8 mm.

This is the only *Onychobaris* which has been discovered in the true Pacific fauna. It is represented by the unique type in the LeConte cabinet, said to have been taken near San Francisco.

16 ***Onychobaris remota*** n. sp.—Oval, strongly convex, not very robust, black with a piceous tinge, the integuments smooth and alutaceous, minutely and densely granulato-reticulate, setæ very minute and short. *Head* finely but strongly punctate anteriorly, the transverse impunctate line marking the feeble impression foveate in the middle; beak finely but deeply, densely punctate throughout, with a fine median impunctate line, rather stout, strongly, evenly arcuate, not more than four-fifths as long as the prothorax; antennæ normal, the second funicular joint fully one-third longer than the third, the club rather large, evenly ovoideo-fusiform, pointed, moderately abrupt. *Prothorax* rather long, scarcely one third wider than long, the sides subparallel or extremely feebly convergent to apical fourth, then strongly rounded and convergent to the apex which is subtubulately constricted; base transverse, the median lobe broad, strongly, evenly rounded and prominent; disk with a narrow but well marked and subentire median line, the punctures abrupt, perforate, rather deep, not very dense, separated by distinctly less than their own widths and about one-third as wide as the scutellum, slightly smaller near the median line. Scutellum moderate, transverse. *Elytra* parabolic behind the humeri, quite distinctly longer than wide, one-half longer than the prothorax, and, at the small and feebly prominent humeri, but slightly wider than the latter; disk not very coarsely but deeply and abruptly striate, the intervals subequal, flat, about one-half wider than the grooves, each with a single series of rather coarse, subtransverse and distant punctures. *Abdomen* not very densely punctured. Length 3.7 mm.; width 1.7 mm.

Texas (El Paso).

The type appears to be a male, the abdomen being very feebly flattened and more sparsely punctured in the middle near the base, while the type of *distans* is apparently a female; but the two forms differ so greatly in bodily form and otherwise, that I regret to believe there is but little doubt of their mutual distinctness.

*Remota* differs from *distans*, irrespective of the shorter beak which may possibly be a sexual character, in its more elongate-oval form, in its much less transverse, more coarsely and pronouncedly more densely punctured prothorax, with narrower median line, and in its longer and more coarsely striate elytra.

17 ***Onychobaris distans*** Lec.—Proc. Ac. Nat. Sci., Phila., 1868, p. 363 (Baridius); Proc. Am. Phil. Soc., XV, p. 296.

A distinct species, moderate in size, somewhat robust and convex, oblong-oval, black, with the integuments feebly shining, alutaceous

and very minutely granulato-reticulate. The beak is somewhat stout, strongly but not very densely punctate, except at the sides toward base where it becomes somewhat rugulose, strongly, evenly arcuate, barely as long as the prothorax, the antennæ normal, with the second funicular joint but slightly longer than the third, the club rather large, elongate, ovoidal, pointed and moderately abrupt. Prothorax two-fifths wider than long, the sides parallel and feebly arcuate to apical fourth, then strongly rounded and convergent and feebly sinuate to the apex, the base broadly bisinuate, the disk with a broad fusiform impunctate line, the punctures rather small, scarcely more than one-fourth as wide as the scutellum laterally, abrupt and perforate, rather sparse and separated by much more than their own widths, becoming a little smaller, more feeble and still sparser toward the median line. Elytra parabolic, but slightly longer than wide, one-half longer and just visibly wider than the prothorax, not very coarsely but deeply and abruptly striate, the intervals flat, subequal, more than twice as wide as the striæ, each with a single series of somewhat small but distinct, subtransverse and very remote punctures, each bearing an extremely short but rather robust seta not projecting beyond its limits. The prosternum very widely separates the small anterior coxæ, and has, near the apex, a small feeble parallel-sided impression, ending anteriorly in two small punctiform foveæ. Length 3.4 mm.; width 1.6 mm.

New Mexico. The type in the cabinet of LeConte is, as far as known, still unique.

18 **Onychobaris molesta** n. sp.—Oval, strongly convex, shining, black with a piceous tinge, the head, beak and legs rufous; setæ very minute and inconspicuous. *Head* obsoletely and sparsely punctured even anteriorly, the feeble impunctate impression with a small deep median fovea; beak strongly, evenly arcuate, moderately stout, fully as long as the prothorax, minutely, rather sparsely punctured, the punctures larger and rather close at the sides; antennæ normal, moderate in length. *Prothorax* moderate in size, not at all inflated, scarcely more than one-fourth wider than long; sides feebly convergent and slightly arcuate from the base, more convergent near the apex, the latter constricted and broadly but briefly subtubulate; base broadly bisinuate, the median lobe rounded and more prominent than the sides; disk somewhat convex. Scutellum transverse. *Elytra* one-fifth longer than wide, about two-thirds longer than the prothorax, and, at the small but distinctly prominent humeri, a little wider than the latter; sides convergent, the apex parabolic; disk with coarse deep and abrupt grooves, the intervals flat, equal, scarcely one-half wider than the grooves, each with a single series of very



large deep rounded, rather close-set punctures which are but slightly irregular on the third. *Abdomen* sparsely punctured, but, as usual, densely so at the sides. Length 4.0–4.5 mm.; width 1.8–2.1 mm.

Arizona.

In one specimen the prothorax is inflated and apparently a little wider than the elytra. Two specimens.

19 **Onychobaris illex** n. sp.—Rather narrowly oval, strongly convex, polished, the pronotum feebly alutaceous, black, the head, beak and legs rufous; setæ very minute, sparse and inconspicuous. *Head* minutely, sparsely punctate, the punctures slightly less remote anteriorly; impression feeble, marked by a very narrow polished and impunctate band; beak somewhat stout, nearly evenly, moderately arcuate, deeply, densely punctate, longitudinally rugulose at the sides, almost evenly cylindrical, scarcely longer than the prothorax; antennæ inserted quite distinctly behind the middle, the basal joint of the funicle about as long as the next three, second slightly longer than wide, obconical, remaining joints gradually, moderately transverse and closely coarctate, the club somewhat abrupt, oval, moderate in size. *Prothorax* scarcely one-third wider than long, the sides broadly arcuate and convergent anteriorly, becoming gradually almost parallel from apical third to the base; subapical constriction obsolete, the apex fully one-half as wide as the base, the latter straight and transverse, the median lobe one-third of the total width, rounded and prominent; disk rather finely, somewhat closely punctate, with a narrow impunctate line not attaining the apex, the punctures about one-fourth as wide as the scutellum and separated by about one-half of their own diameters, becoming sparser in the middle, especially toward base. *Scutellum* transversely lunate. *Elytra* slightly wider than the prothorax and barely two-thirds longer, hemi-elliptical, distinctly longer than wide, the humeri small but decidedly prominent; disk with rather fine, moderately deep, abrupt striæ, the intervals flat, from two to three times as wide as the grooves, sparsely but very unevenly punctate, the punctures rather fine and feeble, more or less transverse, arranged in nearly even single lines on some intervals and more or less confused on others. *Abdomen* finely, not densely punctate, the last three sutures very deeply excavated except at the sides. *Prosternum* flat, with a small transverse groove and two short parallel longitudinal folds anteriorly, the coxæ small and very remote. Length 3.4 mm.; width 1.6 mm.

Colorado.

The single specimen before me represents a species rather closely allied to *molesta*, differing in its more slender form and in the much finer, sparser and transverse punctuation of the elytra, also very noticeably in its much larger pygidium, the types of both of these species being females.

20 **Onychobaris pectorosa** Lec.—Proc. Am. Phil. Soc., XV, p. 295.

Broadly ovate, black and polished throughout, sparsely sculptured, the setæ very minute and only just observable. The beak is strongly arcuate and thickened toward base, but nearly straight in apical half, equal in length to the prothorax and sparsely punctured. The prothorax is nearly one-half wider than long, the sides parallel and straight in basal half, then broadly, evenly rounded and convergent to the apex which is extremely feebly constricted at the sides; base transverse, the lobe equal to one-third the total width, rounded and prominent; disk rather finely, sparsely punctate, with a narrow subentire median line, the punctures scarcely one-fourth as wide as the scutellum, separated by nearly their own widths toward the middle, very dense at the sides but somewhat uneven in distribution throughout. The elytra are but slightly longer than wide, one-half longer and very little wider than the prothorax, the sides nearly straight and unusually strongly convergent, the apex rather narrowly rounded; disk with somewhat coarse, very deep grooves, the intervals alternating slightly in width, from two to three times as wide as the grooves, with rather small but deep, not very close-set punctures, somewhat confused on the wider, but larger and in single series on the narrower, intervals. The antennæ and prosternum are normal in structure. Length 3.8 mm.; width 1.95 mm.

Represented by the unique type in the cabinet of LeConte, taken by Belfrage in Texas, probably at Waco. It is not at all closely allied to any other described species.<sup>1</sup>

21 **Onychobaris diluta** n. sp.—Oval, moderately convex, black and strongly shining throughout, the antennæ piceo-rufous; sculpture not very dense. *Head* minutely, sparsely punctate toward apex, the transverse polished impression rather pronounced; beak slender, strongly arcuate toward base, very feebly so toward apex, distinctly longer than the prothorax and sparsely punctate; antennæ moderate, basal joint of the funicle nearly as long as the next four, second but slightly longer than the third, outer joints rapidly shorter, becoming strongly transverse and coarctate, club normal but rather large. *Prothorax* somewhat more than one-third wider than long, the sides parallel in basal two-thirds, then broadly rounded and convergent to the apex which is distinctly subtubulate; base straight and feebly, posteriorly oblique from the rather small but strongly rounded median lobe to the sides; disk with narrow median impunctate line in basal half, the punctures deep, rounded, rather small, not quite one-third as wide as the scutellum, very dense and contiguous toward the sides but becoming narrowly separated near

<sup>1</sup> Specimens possibly of this species are just received from St. Louis, Mo.

the middle. Scutellum moderate. *Elytra* slightly longer than wide, two-thirds longer than the prothorax, and, at the very feebly evident humeral tuberosities, barely perceptibly wider than the latter; outline behind the humeri hemi-elliptical; disk with rather coarse, very deep, abruptly defined grooves, the intervals flat and subequal, about twice as wide as the grooves, and each with a single series of small, rounded, not very close-set punctures which are about one-half as wide as the intervals; setæ very minute and scarcely observable. *Abdomen* densely punctured, especially toward the sides. Length 2.6 mm.; width 1.2 mm.

#### Texas.

This small species is not closely allied to any other which I have been able to study. The type is apparently a female and is unique.

22 ***Onychobaris porcata*** n. sp.—Oblong-suboval, rather convex, black throughout; integuments polished but deeply and closely sculptured; setæ very short and inconspicuous. *Head* finely, rather sparsely punctured throughout, separated from the beak by a transverse impunctate line, the impression almost obsolete; beak densely, strongly punctured, evenly, rather strongly arcuate, but very slightly longer than the prothorax, gradually but feebly tapering from base to apex; antennæ rather short, the second funicular joint but slightly longer than the third, the outer joints rapidly wider, the seventh as broad as the base of the club, the latter short, oval, not at all abrupt, densely pubescent, with the basal joint but slightly less than one-half the mass, and with a transverse polished fovea at base on the anterior side. *Prothorax* rather short, nearly one-half wider than long, the sides subparallel and feebly arcuate in basal three-fourths, then strongly rounded, thence strongly convergent and feebly sinuate to the apex; base transverse, the lobe one-third the total width, strong, rounded; disk extremely deeply, rather coarsely punctate, the punctures not quite in actual contact but very dense, about one-half as wide as the scutellum, rather uneven in distribution; median impunctate line narrow but distinct, not attaining the apex. Scutellum rather small, transverse. *Elytra* scarcely one-fifth longer than wide, about three-fourths longer than the prothorax, and, at the rather prominent numeri, very distinctly wider than the latter; sides distinctly convergent, the apex broadly parabolic; disk with abrupt, coarse but not deep grooves, roughly sculptured at the bottom, the intervals flat, alternately slightly wider than, and equal to, the grooves, the punctures coarse, deep, approximate or semi-confluent, forming single series taking up nearly the entire width of the narrow intervals, more confused on the broader ones. *Abdomen* rather sparsely punctured toward the middle, polished throughout. Anterior coxæ widely separated. *Legs* deeply punctured; last tarsal joint finely and rather densely pubescent throughout. Length 4.1 mm.; width 2.0 mm.

#### Arizona.

A single specimen which is apparently a female. This very distinct species is quite aberrant in antennal structure.

**MADARELLUS** n. gen.

A series of *Conoproctus quadripustulatus* Fab. (*quadriplagiatus* Lac.), taken by Mr. H. H. Smith on the Amazon near Santarem, shows clearly that Lacordaire's type of *Conoproctus* is the male. In the female the form, sculpture and coloration throughout are similar, but the beak is not so long, more arcuate and tapering, with the antennæ shorter and inserted near the middle, the pygidium being broadly rounded, oblique and perfectly normal. These sexual differences are extraordinary, but are evinced in an unmistakably parallel and, as far as the beak is concerned, almost equally striking manner in another Brazilian species, from the same collection and not yet identified, but which, from its general habitus and simple male pygidium, must be assigned to *Madarus*. Finally, in *Madarus biplagiatus*, which I also have before me, the same sexual differences are observable but to a very slight degree, the antennæ being inserted near apical third in the male and just beyond the middle in the somewhat shorter beak of the female; *quadripustulatus* is however the only species in which the pygidium is affected sexually.

It is quite evident, therefore, that *biplagiatus* and *quadripustulatus* must be placed in the same genus, and I would suggest that these species be included under the name *Conoproctus* Lac., and that the name *Madarus* Sch. be reserved for those species mentioned by Lacordaire (Gen. Col., VII, p. 257), as forming a second section of *Madarus*, and having as types *vorticoides* and *migrator*. Both *Conoproctus* and *Madarus*, as thus limited, have the femora unarmed, and I have here proposed the genus *Madarellus*, to include those species having the prothorax short, broad, very abruptly and strongly constricted at apex, and the femora armed beneath with a minute spiculiform denticle. It differs further from *Conoproctus* in having the posterior lobe of the prosternum broadly emarginate or subtransverse, with the lateral angles acute and not broadly rounded as in that genus, in having a post-apical prosternal fovea with short parallel folds of the surface, and a small triangular scutellum, truncate at base and not large, short and broadly lunate as in *Conoproctus*. The anterior coxæ, it should be added, are much more remote and rather smaller than in the latter genus.

In *Madarellus* the beak is about one-half as long as the body in the female, evenly, distinctly arcuate, slender, the impression separating it from the head being almost completely obsolete and the



epistomal lobe not at all advanced, very broad with the lateral fissures extremely small, the mandibles well developed, each with two deep notches at apex, feebly arcuate and not overlapping when closed but forming a small triangle. Antennæ normal, the first funicular joint as long as the next four, the second but slightly longer than the third, the club moderate, pubescent, scarcely longer than the four preceding joints combined and with the basal joint constituting less than one-half the mass.

The prosternum is very large, flat, thrown up in a transverse tumid ridge just behind the coxæ, in the position of the two transverse tubercles of *Glyptobaris*,<sup>1</sup> the ridge strongly declivous behind and produced over the mesosternum, terminating on a line drawn through the middle of the intermediate coxæ, the process very wide, acutely angulate at the sides and broadly sinuate between the angles. At a short distance behind the anterior margin there are two deep angulate more or less coalescent foveæ, each continued posteriorly for a short distance by a fine but distinct fold of the surface. Anterior coxæ small, very remote, separated by fully twice their own width. Legs moderate, the tarsi normal, with the third joint broad, bilobed; claws moderate, perfectly free, somewhat divergent. Scutellum small, triangular or ogival, not in the least emarginate at base.

That two genera, mutually so dissimilar in appearance as *Madarellus* and *Glyptobaris*, should in reality be so closely allied, is one of these interesting surprises continually offering themselves in these little-studied groups. I am quite unable to agree with LeConte in his statement that *Ampelogypter* makes a gradual transition from *Baris* to *Madarellus*, for the latter is much more closely allied to *Baris* through *Onychobaris* than is *Ampelogypter*, this genus forming one of the pseudobaride series; but, at the same time, the position assigned to *Madarus* by Lacordaire seems to be equally unnatural.

**1 *Madarellus undulatus*** Say—Journ. Ac. Nat. Sci., Phila., III, p. 315; Ed. Lec., II, p. 177 (*Rhynchænus*); *sanguinicollis* Dej. Cat. 3ed, p. 311.

This species is so well known, that a detailed description is needless at the present time. The form is subcuneate, rather wider at the middle of the prothorax than at any other part, the thoracic punctures extremely minute, feeble and sparse, but becoming rather closer, stronger and feebly rugulose or subasperate anteriorly, rugu-

<sup>1</sup> Compare also the South American genus *Scambus* Sch.

lose at the sides, and with an even series of small but deep punctures just before the basal margin not quite extending to the scutellum. The elytral striæ are in the form of narrow but deep abrupt grooves, minutely and distantly punctate at the bottom, the intervals flat, wide, each with a single series of excessively minute distant punctures, except the lateral three, where the punctures become distinct but feeble, not very dense, confused and transversely rugulose or subasperate. The lustre throughout is highly polished, and the color black, the prothorax being often entirely red, but I do not notice that this character is at all geographical in origin as stated by LeConte (Proc. Am. Phil. Soc., XV, p. 301), a good series before me from Indiana being composed of both color modifications in equal numbers. It varies greatly in size. Length 2.7–4.7 mm ; width 1.3–2.2 mm.

Entire Atlantic region, extending westward to Kansas and Texas. The anterior femora are armed beneath with a small tooth, which is rendered more prominent by reason of a deep and abrupt subapical emargination immediately beyond it. The intermediate and posterior femora are not distinctly denticulate in *undulatus*, but in an entirely similar, but shorter and broader species before me, from Santarem, Brazil, all the femora are distinctly spiculate beneath.

The pygidium in this genus is distinctly oblique in the male but vertical in the female, which corresponds somewhat with the pygidial differences of the male and female in *Conoproctus quadripustulatus*.

### AULOBARIS.

LeConte—Proc. Am. Phil. Soc., XV, p. 288.

This genus is one of the most distinct of the tribe, and is remarkably homogeneous in the general aspect of its species, which are unusually convex, polished and, with the exception of *dux*, almost evenly ellipsoidal in form.

Aulobaris differs from all of our other genera of pygidiate Barini, in having the second funicular joint elongate and fully as long as the next two combined. In its free and divergent tarsal claws it resembles Baris, but in spite of this there is a certain assemblage of characters which suggests a rather closer relationship with Pseudobaris. In fact *Aulobaris pusilla* was originally described as a Pseudobaris, and *Pseudobaris anthracina* (Lec. nec Boh.) as an Aulobaris, showing how closely they approach each other in external

facies. But in addition to this they are allied in the deep sulcus of the prosternum common to both; it is however rather less abruptly defined at the edges in the present genus, and besides differs radically in serving as a partial shelter for the beak in repose.

In *A. naso* the sulcus is broadly sinuate at the sides, the latter projecting inward just before the coxæ, touching the middle of the beak when the latter is folded in against the body. These projections of the sides before the coxæ, although not very prominent, are extremely interesting as being the nearest approach to similar modifications of the sides of the rostral sulcus observable in many cryptorhynchs. *Aulobaris* in fact possesses several suggestive cryptorhynchine characteristics. It is interesting in this connection to call attention to the close general similarity of certain barides, as *Eisonyx* and *Aulobaris*, to such cryptorhynchs as *Baropsis* and *Tyloderma*.

The remaining characters of *Aulobaris* are not of especially decisive value, but it should be mentioned that the third tarsal joint is unusually wide and deeply bilobed, and that the prosternum is prolonged behind slightly over the mesosternum, the process being wide flat and broadly arcuate at apex. In *Madarellus* it is still further prolonged upon the mesosternum and is broadly sinuate or subtruncate throughout its width. In all of our species there is a small cluster of squamules at the base of the third elytral interval, as in many species of *Pseudobaris*.

In *A. scolopax* the sexual characters are very pronounced, the abdomen in the female being strongly conical and upwardly ascending toward apex, with the pygidium small. In the male it is nearly horizontal, with the pygidium much larger. These pygidial differences are of the same general order as in *Baris*. In the female of *scolopax* the prothorax is much shorter than in the male, as in *Centrinus scutellum-album*.

The species are not numerous and may be separated as follows:—

Prothorax feebly transverse and much narrower than the elytra, moderately convex, with the basal lobe rather prominent.

Prosternal sulcus sinuate at the sides and produced inwardly near the coxæ; elytral punctures coarse, deep and rounded.....1 **naso**

Prosternal sulcus straight at the sides, without the ante-coxal projection; elytral punctures small, feebly impressed and slightly transverse.

Piceous-black to pale rufo-piceous in color.

Smaller and darker species.....2 **pusilla**

Larger species, paler in color.....3 **scolopax**

Intense black, highly polished, the legs black or rufescent; body rather more robust, the prothorax more strongly constricted at the apex.

4 **ibis**

Prothorax strongly transverse and rather wider than the elytra, very strongly convex toward base, the basal lobe small and feeble; elytral punctures coarse.....5 **dux**

1 **Aulobaris naso** Lec.—Proc. Am. Phil. Soc., XV, p. 299.

Ellipsoidal, strongly convex, polished and piceous-black throughout, the setæ very minute on the upper surface, with a few squamules at the base of the third interval, each puncture of the under surface bearing an elongate recumbent strigose scale. Head finely but distinctly punctate, the transverse impression feeble and finely subfoveolate in the middle; beak rather slender, strongly, evenly arcuate and as long as the head and prothorax, the antennæ slender, first funicular joint long, the second more than twice as long as wide, two-thirds as long as the first and equal to the next two, third a little longer than wide, outer joints but slightly wider, club oval, densely pubescent, equal in length to the preceding five joints combined, the basal joint constituting much less than one-half the mass. Prothorax conical, strongly convex, one-third wider than long, with the sides broadly and evenly arcuate and only very feebly constricted near the apex, which is transversely truncate and not quite one-half as wide as the base; punctures small but deep and distinctly separated. Scutellum moderate, transverse. The elytra are slightly longer than wide, two-thirds longer and scarcely perceptibly wider than the prothorax, hemi-elliptical in outline, the humeral tuberosities very feeble, the striæ rather coarse and deep, with the intervals about twice as wide as the grooves, and each with a single series of large deep rounded and somewhat close-set punctures. Length 2.8–3.3 mm.; width 1.3–1.6 mm.

The four specimens in my cabinet are from Kansas and Iowa, and the reference of certain Californian specimens to this species by Dr. LeConte is apparently incorrect, these being identical with *pusilla*.

The reference to *nasutus* (l. c. ante) is somewhat confusing. LeConte refers to Say's Curc., Ed. Lec., I, p. 295, but this reference was probably intended to be Proc. Ac. Nat. Sci., Phila., 1868, p. 364, where the author has described this species under that name, forgetting that he had already described a *Centrinus nasutus*. As *Centrinus* and *Aulobaris* are widely different genera, there was no necessity for the change of name, but since they are both proposed



by the same author, and as *naso* is the name adopted in the most extensive monograph of our Rhynchophora, it is preferable to continue it.

The prosternal groove is very large deep and abrupt, serving as a partial shelter for the beak, which, in repose, is placed in the groove with its apex extending far beyond it and resting on the flat surface of the mesosternum. The strong arcuation of the beak prevents it from touching the bottom of the groove however, and, at the sides, it is in contact only just before the coxæ, where there is an internal horizontal projection, not distinctly observable in any other species.

**2 *Aulobaris pusilla*** Lec.—Proc. Ac. Nat. Sci., Phila., 1868, p. 363 (Baridius); Proc. Am. Phil. Soc., XV, p. 298 (Pseudobaris).

Almost exactly similar throughout to *naso*, but rather shorter, relatively stouter, and with the interstitial punctures smaller, much feebler, close-set and subtransverse. The second funicular joint is fully three-fourths as long as the first and as long as the next two, the club small and not longer than the four preceding joints together. The prosternal sulcus is as wide and deep as in *naso*, but the sides are straight and not broadly sinuate, there being no visible trace of the internal projection just before the coxæ referred to under that species. Length 2.5–3.0 mm.; width 1.1–1.4 mm.

I have seen specimens from New York, District of Columbia, North Carolina and one labeled "California." Dr. LeConte evidently limited his attention to the prosternal sulcus only, in placing this species in *Pseudobaris*.

**3 *Aulobaris scolopax*** Say—Curc. 26, Ed. Lec., I, p. 295 (Baridius).

Similar in form, and in antennal and prosternal structure to *pusilla*, but distinctly larger, pale red-brown in color, the elytral striæ finer, the intervals wider, the punctures broadly confused on the second and third but forming single lines on the others, small, feeble, moderately close-set and slightly transverse. The punctuation of the pronotum varies greatly, being sometimes decidedly coarse and at others quite fine; the punctures also vary in density, although usually distinctly separated, and there is a narrow incomplete impunctate line, which occasionally entirely disappears, as remarked by LeConte. This latter fact is however characteristic of the entire tribe, when the impunctate line is not especially broad and decided or cariniform. Length 3.3–3.7 mm.; width 1.65–1.8 mm.

Indiana, Kentucky and Wisconsin. Moderately abundant.

4 **Aulobaris ibis** Lec.—Proc. Ac. Nat. Sci., Phila., 1868, p. 365 (Bari-dius).

Nearly similar to the preceding species in form but more robust, polished and intense black with the legs black or rufescent and with the sculpture rather sparser. The antennæ are slender, the second funicular joint much more than twice as long as wide, three-fourths as long as the first and rather longer than the next two, the latter equal and quadrate; club very small, oval, abrupt, subequal in length to the three preceding joints combined. Prothorax two-fifths wider than long, the punctures variable in size as in *scolopax*. Elytral intervals each with a single uneven series of small very feeble moderately distant and subtransverse punctures. Prosternal sulcus wide, very deep, straight and moderately abrupt. Length 3.0–3.6 mm.; width 1.5–1.8 mm.

Georgia—LeConte; Florida (Enterprise) in abundance—Mr. Schwarz. One specimen is labeled "Massachusetts" but this is possibly an error.

5 **Aulobaris dux** n. sp.—Rather robust and subcuneiform, very strongly convex, polished throughout, black with a piceous tinge, the legs dark rufous; setæ small, slender, sparse and inconspicuous above, but robust, squamiform, yellowish-white, abundant and distinct beneath, the elytra with small squamulose spots at the base of the alternate intervals, more noticeable on the third. *Head* minutely, sparsely punctured, the impression broad and feeble in profile; beak rather slender, finely, strongly but not very densely punctate, evenly and rather feebly arcuate, thickened toward base, a little longer than the head and prothorax; antennæ slender, the second funicular joint fully three-fourths as long as the first and as long as the next two, the latter both slightly longer than wide, seventh rather transverse, club not much longer than the three preceding joints combined. *Prothorax* large, nearly one-half wider than long, strongly rounded at the sides near the base, then rapidly narrowed to the apex, the sides strongly convergent and feebly arcuate in apical two-thirds, subapical constriction very feeble, apex about one-half as wide as the base, the latter transverse, the lobe very feeble; disk strongly convex, almost tumid toward base viewed laterally, finely but deeply punctate, the punctures sparse, separated by nearly twice their own widths, with a narrow impunctate area near the centre. Scutellum quite large, transverse, broadly rounded behind, rugosely punctured. *Elytra* not quite as wide as the prothorax and three-fourths longer than the latter, the sides nearly straight and rather strongly convergent from the base, the apex not very broadly rounded; humeri feebly tumid, not at all prominent; disk deeply, strongly striate, the intervals about twice as wide as the grooves, each with a series of coarse, deep, transversely oval, moderately close-set punctures, which are more or less uneven or confused on the third and fifth, especially in the female. *Abdomen* strongly

rather closely punctured. Prosternum with a very deep parallel-sided sulcus, as wide as the beak, the coxæ separated by about their own width. Length 3.9-4.2 mm.; width 1.8-2.0 mm.

Nebraska.

This is the largest species of the genus which I have seen, and differs greatly from the others in its distinctly subeuneate form, with the prothorax wider toward base and much more swollen throughout the width.

### AMPELOGLYPTER.

LeConte—Proc. Am. Phil. Soc., XV, p. 299.

A distinct genus, evidently composite in its characters and forming one of the transitions from *Madarellus* to *Pseudobaris*, but, in spite of the polished glabrous integuments and finely striate, impressed and subimpunctate elytra, which give it an external resemblance to the former, it is in reality much more closely allied to the latter of these genera.

The prosternal modification is peculiar to this genus, although feebly suggested in some other forms such as *Glyptobaris*. In *sesostris* it is widely and rather feebly impressed, the impression becoming flat and obsolete between the coxæ, subimpunctate throughout, widening slightly anteriorly, and ending near the apical margin, at the transverse prothoracic constriction. At its anterior limit it is deepest, and is bounded by an abrupt declivous wall which is transverse and nearly straight; the sides of the excavation are also abrupt for a short distance behind the apex. In *longipennis* it is rather wider and more feeble, but deep and abruptly limited at each apical angle. It is easy to perceive here an extreme development of the two deep foveæ and connecting groove mentioned under *Onychobaris* and its allies, only here the two angles of the impression, which represent the foveæ, are relatively much more widely separated.

The anterior coxæ are small, rather distant and separated by more than their own width. The beak and antennæ present no noticeable peculiarities, being nearly as in *Pseudobaris*. The claws are moderately long, closely connate in basal third, subparallel and gradually, feebly everted toward tip as in the *pseudobarides* generally, and differing radically from the normally free and divergent form seen in *Madarellus*.

Our three species may be readily distinguished as follows:—

Prothorax parallel at the sides in basal two-thirds, the beak shorter, strongly arcuate; second funicular joint quadrate; elytra not more than twice as long as the prothorax; color intense black throughout, the antennæ and tarsi rufous .....1 **ater**

Prothorax convergent at the sides from the basal angles; beak longer and less stout; antennæ more slender, the second funicular joint distinctly longer than wide.

Intense black throughout the body and antennæ, the tarsi rufous; prothorax short, the apex not much more than one-half as wide as the base; elytra nearly two and one-half times as long as the prothorax.

## 2 **longipennis**

Pale rufo-testaceous throughout; prothorax less transverse, the apex much more than one-half as wide as the base; elytra about twice as long as the prothorax; size somewhat smaller .....3 **sesostris**

1 **Ampelogypter ater** Lec.—Proc. Am. Phil. Soc., XV, p. 300; *ampelopsis* (Madarus), Walsh and Riley, i. litt.

Oblong, moderately convex, highly polished and black throughout, the antennæ and tarsi rufous. Head minutely, sparsely punctate, convex, separated from the beak by a distinct transverse impression; beak rugulose, very robust, strongly, evenly arcuate, slightly longer than the prothorax in the male; antennæ stout, first funicular joint robust, fully as long as the next three, second exactly quadrate, three to seven much shorter and all strongly transverse, increasing gradually in width, club robust, densely pubescent, the basal joint constituting much less than one-half the mass. Prothorax two-fifths wider than long, the sides straight and subparallel in basal two-thirds, then very abruptly and strongly rounded, almost rectangular, thence subtransversely convergent for a considerable distance to the apical tubulation, which is strong, constituting one-fourth of the total length; disk with a rather wide and subentire impunctate line, the punctures very distinct, deep, sparse, with large impunctate areas laterally, rugulose at the sides. The elytra are about one-fourth longer than wide, twice as long as the prothorax and a little wider than the latter at the somewhat prominent humeri; striæ very fine but deep and abrupt; intervals flat, very wide and almost impunctate, the punctures of the single series being remote, very feeble and scarcely visible. Abdomen extremely densely punctate toward the sides. Length 2.8 mm.; width 1.3 mm.

Easily distinguishable by the rather broad form, with short parallel-sided prothorax and somewhat thicker beak. Eastern States.



2 **Ampelogypter longipennis** n. sp.—Sub-oval, moderately convex, very highly polished; body and antennæ throughout intense black; tarsi rufous; setæ very minute. *Head* opaque; beak shining, rugulosely punctate at the sides, rather slender, moderately arcuate and fully one-half longer than the prothorax in the female, distinctly shorter, more arcuate and a little stouter in the male; antennæ nearly as in *sesostris*. *Prothorax* short, nearly two-thirds wider than long, the sides strongly convergent and nearly straight to apical third, then broadly rounded and more convergent to the broad and subtubulate apex, the latter not more than one-half as wide as the base; disk with scarcely a trace of impunctate line, the punctures very fine, sparse and irregularly distributed, forming longitudinal rugæ at the sides. *Scutellum* very small, rounded. *Elytra* two-fifths longer than wide, nearly two and one-half times as long as the prothorax, and, at base, a little wider than the latter; humeri longitudinally tumid and somewhat prominent; sides behind them feebly convergent and nearly straight, the apex abruptly rounded; disk with extremely fine but deep abrupt grooves and wide flat subimpunctate intervals as in *ater*, the grooves finely, remotely punctate at the bottom. Under surface and abdomen toward the sides very densely punctate but not very dull in lustre. Length 3.0–3.3 mm.; width 1.3–1.6 mm.

Pennsylvania; Maryland; Nebraska.

This species is allied to *sesostris*, having an entirely similar structure of the prothorax, beak and antennæ, but is larger, still more highly polished especially toward the sides of the upper surface, intense black in color and with relatively longer elytra, the prothorax, also, is shorter and broader, with the sides more rapidly convergent from the base, and the tubulate apical portion is shorter, less abrupt and much narrower when compared with the basal width. The pronotum is more finely punctate and devoid of impunctate line, but occasionally has a small impressed fovea at the centre of the disk. The two specimens from Maryland have the elytra dark castaneous but do not otherwise differ. Sixteen examples. *Longipennis* is generally confounded in cabinets with *ater*.

3 **Ampelogypter sesostris** Lec.—Proc. Ac. Nat. Sci., Phila., 1868, p. 364 (Baridius); *viitis* Riley: 1st Missouri Report, p. 131 (Madarus).

Rather narrowly oval, moderately convex, polished, pale red-brown throughout, the setæ extremely minute. Head dull, obsoletely punctulate; beak shining, rather slender and one-half longer than the prothorax in the female, feebly arcuate, abruptly more strongly so at base, the transverse impression rather strong; antennæ inserted just behind the middle, the funicle rather slender, the second joint much longer than wide and fully one-half longer than the third, three to seven equal in length, gradually wider, the

club oval, pointed, densely pubescent and as long as the preceding five joints, with its basal joint constituting two-fifths of the mass. The prothorax is feebly narrowed and straight at the sides to apical third, then broadly rounded, more convergent and deeply sinuate to the apex, the latter subtubulate and three-fifths as wide as the base; disk finely but rather sparsely, distinctly and unevenly punctate, with a subentire impunctate line. Elytra one-fourth longer than wide, a little wider than the prothorax and not distinctly more than twice as long as the latter, striate and subimpunctate as in *ater*. Under surface, except along the middle of the abdomen, and also the legs throughout deeply, densely punctate and opaque. Length 2.7 mm.; width 1.2 mm.

The two specimens in my cabinet are from Illinois, and are not as large as the type measured by LeConte (3.0 mm.).

#### **DESMOGLYPTUS** n. gen.

This genus is closely allied to *Pseudobaris* and has the prosternum deeply and abruptly sulcate throughout its length, the anterior coxæ being somewhat remote and separated by fully their own width. The beak, antennæ, tarsal claws and scutellum are also nearly as in *Pseudobaris*, but the other characters are so different that the unique species cannot be appropriately associated with the members of that genus.

The general appearance and elytral sculpture are essentially unlike anything else in the present tribe which I have been able to study, but it is possible that the *Baridius cribratus* of Boheman may be somewhat similar, or perhaps even congeneric. The form of the body reminds us strongly of *Copturus*, and the opaque surface, deep impressed and strongly crenulate striæ, with narrow and convex intervals, together with the unusually prominent subapical umbones, are a combination of characters apparently isolating the genus widely from its allies. It should be stated, however, that the peculiar outline is feebly suggested in *Pseudobaris angusta*.

*Desmoglyptus* differs from *Pseudobaris* radically, also, in the formation of the pygidium and elytral apices, the latter being deeply and vertically truncate or deflexed, covering a large part of the pygidium, which is small, vertical and flat. In *Pseudobaris* the pygidium is large, convex and prominent, the elytra being normal at apex and leaving it completely exposed. In *Desmoglyptus* the third tarsal joint is abruptly very large, but not quite as wide as

long, the emargination being unusually deep; the basal node of the fourth joint is distinct and a little longer than wide.

The single species is described below; it has comparatively little affinity with *Ampelogypter*, where it was provisionally placed by LeConte.

1 ***Desmoglyptus crenatus*** Lec.—Proc. Am. Phil. Soc., XV, p. 300 (*Ampelogypter*).

Very narrow, subcylindrical, pale red-brown throughout and densely opaque, the setæ not distinct. Head rather convex, minutely, obsoletely punctate, the beak equal in length to the prothorax in the male, robust, strongly, evenly arcuate, feebly flattened toward apex, obsoletely punctate, the antennæ inserted well beyond the middle, normal in structure, the first funicular joint as long as the next three, two to seven equal in length, the outer gradually slightly wider, the club oval, about as long as the preceding five joints together, pubescent, with the basal joint constituting much less than one-half the mass. Prothorax nearly as long as wide, the apex broadly subtubulate, the sides parallel and straight in basal two-thirds; apical margin feebly arcuate and three-fourths as wide as the base; disk without impunctate line, the punctures rather coarse, deep and dense. Scutellum small, rounded. Elytra three-fourths longer than wide, a little wider than the prothorax and about twice as long as the latter, the humeri slightly prominent; sides parallel in basal three-fifths, broadly sinuate behind the humeri, the apex narrowly subtruncate; disk of each strongly umbonate or callous in the middle near apical fourth, the striæ coarse deep and impressed, remotely but strongly crenate, the intervals narrow, convex, each with a single series of remote minute and excessively feeble punctures, which are scarcely at all observable under moderate power. Abdomen not densely punctate, with a very large broad and deep basal impression in the male; in this sex the thickened posterior edge of the fifth segment is deeply, transversely excavated opposite the apex of the pygidium, and from the bottom of this excavation there projects a small, short and transverse polished tubercle. Length 2.7–3.0 mm.; width 1.0 mm.

The two specimens before me are males and one of them is labeled "Arizona." LeConte gives Virginia and Maryland as the habitat of his types.

**PSEUDOBARIS.**

LeConte—Proc. Am. Phil. Soc., XV, p. 297.

In geographical distribution this distinct genus coincides with *Baris* and is well represented in Brazil. The species within our territories are much less numerous than those of *Baris*, and are usually of a narrower and more cylindrically convex form. Some, however, are robust, but are then more oval and ellipsoidal and less oblong than in the genus referred to. The generic characters have been given in the table and need not be repeated at the present time.

One of the most striking peculiarities of the genus is the deep, abrupt, parallel-sided and subimpunctate prosternal sulcus. The fact that the sulcus should be so well developed and abruptly defined at the sides in most of the species, when it can fulfill no function as a shelter for the beak, because of the robust form and much greater lateral dimensions of the latter, might be regarded as a proof that the *Barini* are simply cryptorhynchids which have become modified through changed habits or some other altered environment, and, that under their influence, the beak and mesosternal epimera have become modified with comparative rapidity. The prosternal sulcus, being a long established and extremely permanent structure, would survive in an essentially unaltered state for a long period after all need of it had disappeared.

The species known to me may be distinguished by the following characters:—

Elytral vestiture uniform, generally short and sparse.

Elytra with a small condensed pubescent spot at the base of the third interval.

Pronotal punctures sparse, the impunctate line obsolete.

Large species, robust, piceo-testaceous in color .....1 **farcta**

Moderate in size, rather robust, black throughout, polished, without trace of æneous lustre, the pronotal punctures and elytral striæ coarse and deep; intervals not carinate toward apex...2 **luctuosa**

Pronotal punctures much closer.

Body elongate-oval, rather alutaceous in lustre, median impunctate line of the pronotum narrow and distinct but not quite entire.

3 **discreta**

Body broadly oblong-oval, highly polished, the median line obsolete.

4 **fausta**

Elytra without basal condensed spot on the third interval.

Form more broadly oval; interstitial punctures large, deep, rounded and conspicuous, especially toward base.



Larger species, very broadly oval and subdepressed, dull in lustre ;  
 elytral grooves coarse, the setæ very minute.....5 **pectoralis**  
 Smaller, more elongate-oval, highly polished, the elytral striæ much  
 less coarse, the setæ longer, semi-erect and quite conspicuous.

6 **lugubris**

Form slender, cylindrical, the interstitial punctures small, feeble, remote  
 and transversely subrugulose.....7 **angusta**

Elytral vestiture consisting of very small inconspicuous setæ and long white  
 widely dispersed squamules.

Larger species, with the pronotal punctures moderate in size, very dense  
 and with a more or less distinct and abruptly defined median impunctate  
 line .....8 **nigrina**

Small species, with the pronotal punctures coarse and slightly separated,  
 without trace of median impunctate line .....9 **cælata**

The Mexican *acutipennis* of Say also belongs to this genus, and  
 has the elytral intervals prominent and subcarinate on the posterior  
 declivity, as in several other species of the Central American regions.

1 **Pseudobaris farcta** Lec.—Proc. Ac. Nat. Sci. Phila., 1868, p. 362  
 (Baridius) ; Proc. Am. Phil. Soc., XV, p. 297.

A conspicuous species, the largest of the genus, of a broadly  
 evenly oval, very convex form, dark piceo-rufous color and polished  
 integuments. The beak is evenly but rather feebly arcuate, robust,  
 becoming rapidly thin and flattened near the apex, slightly shorter  
 in the male than in the female, and, in both sexes, distinctly shorter  
 than the prothorax ; the antennæ are normal, with the second funi-  
 cular joint one-half longer than the third. The prothorax is nearly  
 one-half wider than long, the sides convergent and broadly arcuate  
 from base to apex, broadly and distinctly constricted near the latter,  
 the constriction being evident and more densely, rugosely punctate  
 almost entirely across the dorsal surface ; base transverse, the median  
 lobe small but very prominent ; the disk is coarsely but not very  
 densely punctate, without impunctate line. Elytra quite distinctly  
 wider, and fully three-fourths longer than the prothorax, hemi-  
 elliptical, the disk with rather coarse deep and abrupt grooves, the  
 intervals flat, scarcely twice as wide as the grooves, the second and  
 third much wider, the punctures rather large, moderately deep, not  
 very close-set and distinctly transverse, forming single series on  
 each, but sparsely confused on the second and third. The anterior  
 coxæ are separated by their own width, the prosternum before them  
 narrowly deeply and abruptly sulcate. Length 4.7–5.0 mm. ; width  
 2.4–2.6 mm.

Texas, three specimens; Kansas and Colorado—LeConte.

2 **Pseudobaris luctuosa** n. sp.—Rather broadly, almost evenly oval, strongly convex, intense black and highly polished throughout. *Head* minutely, sparsely punctate, the transverse impression rather strong; beak densely punctate only on the sides behind the antennæ, somewhat tumid above at base, strongly, evenly arcuate, slender and nearly one-third longer than the prothorax in the female, rather thicker and but very slightly longer than the latter in the male; antennæ moderate, the second funicular joint unusually long and subequal to the next two together. *Prothorax* short, nearly one-half wider than long, the sides broadly arcuate and convergent anteriorly, gradually becoming parallel toward base, the apex broad, truncate, tubularly but very briefly produced; base transverse and straight laterally, the median lobe one-third the total width, rounded and decidedly prominent; disk strongly convex, coarsely, very deeply and rather sparsely punctate, the punctures fully one-half as wide as the scutellum and separated by their own widths or more. Scutellum small, transverse, impressed. *Elytra* twice as long as the prothorax, and, at the feebly tumid humeri, scarcely perceptibly wider than the latter; outline hemi-elliptical; disk with coarse, very deep, not distinctly punctate grooves, the intervals subequal, about one-third wider than the grooves, each with a single series of shallow, rather remote and transversely subrugulose punctures; setæ not at all visible except a small spot of white squamules at the base of the third interval. Under surface somewhat sparsely punctured. Length 3.5–3.7 mm.; width 1.7–1.8 mm.

Florida (Cedar Keys).

This species is named *anthracina* Boh. in many cabinets, and was placed in *Aulobaris* by LeConte (Proc. Am. Phil. Soc., XV, p. 289), but is evidently not the species described under that name in the work of Schönherr. The phrases “thorax postice longitudine fere latior,” for a strongly transverse prothorax, and “[thorax] supra fere planus . . . evidenter crebre . . . punctatus,” for a strongly convex, coarsely and sparsely punctate modification of this part, and “elytra . . . thoracis . . . dimidio longiora,” for fully twice as long, will not at all answer for this insect. As no allusion to a pygidium is made in the original description, it is possible that *Baridius anthracinus* Boh. may be a species of the genus *Limnobaris*, but we shall probably never know definitely until the type can be consulted.

3 **Pseudobaris discreta** n. sp.—Elongate-oval, strongly convex, black throughout and rather shining, the prothorax duller and alutaceous; setæ small, subrecumbent sparse but quite visible, not intermixed with longer squamules but larger and coarser and forming a more or less distinct spot at the base of the third and fifth intervals. *Head* and base of the beak opaque and densely granulate-reticulate, the former minutely and obsoletely punctate,

the latter abruptly coarsely, densely so near the base and at the sides, elsewhere shining and almost impunctate, the transverse impression feeble and not at all shining; beak slender, rather feebly but evenly arcuate, somewhat abruptly thicker very near the base in the densely punctured part, distinctly longer than the prothorax; antennæ slender, the second funicular joint nearly twice as long as wide and one-half longer than the third, the latter a little longer than wide. *Prothorax* barely one-fifth wider than long, the sides subparallel in basal two-thirds, then strongly rounded and convergent to the apex, the later strongly constricted and subtubulate; base transverse, the median lobe very small but prominent, scarcely rounded and rather cuspidiform; disk with narrow ill-defined non-entire impunctate line, the punctures deep, one-third as wide as the scutellum, dense but narrowly separated. *Elytra* two-fifths longer than wide, fully twice as long as the prothorax and a little wider than the latter, the humeri slightly prominent, the sides very feebly convergent; apex somewhat abruptly and obtusely rounded; disk with moderately fine deep striæ, the intervals subequal, flat, about twice as wide as the grooves, each with a more or less uneven single series of moderately large but shallow, subtransverse, somewhat close-set punctures. *Abdomen* rather closely punctured. Prosternum abruptly, deeply sulcate, the sulcus extending deeply nearly to the posterior limits of the coxæ, the latter separated by about their own width. Length 4.0 mm.; width 1.7 mm.

#### Texas.

A distinct species somewhat resembling *angusta* in form. The tarsal claws are unusually long. A single specimen.

**4 *Pseudobaris fausta* n. sp.**—Oblong-oval, convex, black and highly polished throughout, the setæ small, very sparse, not conspicuous, the elytra without dispersed squamules but with a small feebly condensed spot at the base of the third interval. *Head* minutely, sparsely but rather deeply punctulate, the impression feeble; beak rather stout, evenly, moderately arcuate, feebly tapering, deeply, densely punctate and about as long as the prothorax; antennæ inserted at the middle, the basal joint of the funicle not quite as long as the next three, the second obconical, one-half longer than wide, club rather large, abrupt, densely pubescent, with the basal joint constituting one-third of the mass. *Prothorax* nearly one-half wider than long, the sides nearly straight and parallel to slightly beyond the middle, then broadly rounded and convergent, the subapical constriction very broad and feeble; base transverse, the median lobe moderate in width, very prominent and rounded; disk rather coarsely, very deeply, moderately closely punctate, without impunctate line, the punctures rather uneven in distribution, fully one-third as wide as the scutellum and generally separated by about one-half of their own diameters. Scutellum strongly transverse, lunate. *Elytra* distinctly wider than the prothorax and not quite twice as long, the humeri moderately prominent; sides distinctly convergent, nearly straight, the apex broadly rounded; disk deeply, not very coarsely striate, the intervals twice as wide as the grooves, each with a single series of very coarse, transversely oval, moderately distant punctures,

the second and third wider and with the punctures smaller, very sparse but more confused. *Abdomen* deeply but not densely or coarsely punctate. Prosternum with a wide, rather shallow, unusually feebly defined sulcus, the bottom of which is coarsely, closely punctate, the coxæ moderate in size and separated by much more than their own width. Length 3.65 mm.; width 1.75 mm.

#### Arizona.

*Lugubris* is the only species with which the present can be compared, but there are many radical points of difference. In *fausta* the form of the body is much broader, and the punctuation throughout very much coarser, with but the feeblest trace of a narrow and partial impunctate line on the pronotum. The prosternal groove is rather narrow, much deeper and more sharply defined in *lugubris*, and, in the latter, there is no condensed spot at the base of the third interval.

#### 5 *Pseudobaris pectoralis* Lec.—Proc. Am. Phil. Soc., XV, p. 420.

Rather broadly oval and quite distinctly depressed, black throughout, dull and strongly alutaceous, the setæ not distinctly visible under moderate power. The beak is slender, moderately and evenly arcuate, fully as long as the prothorax in the male, and a little longer in the female, not rapidly flattened toward apex and separated from the head by a rather deep but broad impression; antennæ moderate, the second funicular joint quadrate and but very slightly longer than the third. Prothorax rather short, nearly one-half wider than long, the sides strongly convergent from base to apex and broadly, distinctly arcuate, sometimes feebly prominent near apical third and feebly constricted subapically, the disk with a narrow ill-defined impunctate line, the punctures coarse, deep, not very dense and unevenly distributed. Elytra a little wider than the prothorax, fully twice as long, a little longer than wide and hemi-elliptical behind the humeri, the disk coarsely, deeply grooved, the intervals flat, subequal throughout and about one-half wider than the grooves, the punctures somewhat coarse, deep, close and more or less confused, larger and generally forming a more even single series on the fourth and occasionally, also, on the second and sixth intervals. The prosternum is deeply and abruptly sulcate, the sulcus becoming shallow and coarsely punctate between the coxæ which are separated by about their own width. Length 4.3 mm.; width 2.1–2.2 mm.

Florida. A distinct and rather large species. I have before me a single pair, agreeing in every detail with the original type.



6 **Pseudobaris lugubris** n. sp.—Oval, moderately robust, strongly convex, black throughout and polished, the setæ short, sparse but distinct, not condensed at the base of the third interval and without longer scattered squamules. *Head* finely, distinctly, the beak rather coarsely, punctured, more densely in the male, strongly arcuate and quite distinctly longer than the prothorax in both sexes, the antennæ moderate, with the second funicular joint distinctly longer than the third. *Prothorax* nearly one-third wider than long, the sides subparallel or very feebly convergent and nearly straight to apical third, then strongly rounded and convergent to the apex, the latter broad, truncate, three-fifths as wide as the base and briefly tubulate; base transverse, the median lobe small but prominent, broadly rounded at apex; disk with a narrow ill-defined impunctate line which does not attain the apex, the punctures rather fine, scarcely one-fourth as wide as the scutellum and dense, somewhat unevenly distributed and very narrowly separated. *Elytra* hemi-elliptical, distinctly longer than wide, not quite twice as long as the prothorax and a little wider than the latter; disk with moderately fine but very deep abrupt grooves, the intervals flat, subequal, about twice as wide as the grooves, each with a single series of somewhat small, shallow, moderately remote punctures. *Prosternum* deeply, abruptly sulcate, the coxæ rather small and separated by a little more than their own width. Length 3.0–3.3 mm.; width 1.3–1.6 mm.

New Mexico (Albuquerque).

A rather small species, resembling *nigrina* in outline, but with smaller, feebler interstitial punctures and devoid of scattered squamules; from *angusta* it is at once distinguishable by its much more broadly oval form. The smallest and narrowest specimen before me is a female, the largest a male. Four specimens.

I have united with this species a still smaller specimen from Texas, which differs in its slightly coarser and very dense pronotal punctures and scarcely larger but much deeper interstitial punctures; it possibly represents a distinct species.

7 **Pseudobaris angusta** Lec.—Proc. Ac. Nat. Sci., Phila., 1868, p. 363 (Baridius); Proc. Am. Phil. Soc., XV, p. 298; *P. angustula* Lec., ibid. p. 420.

Oval, subcylindrically convex, rather polished, deep black throughout. The beak is slender, evenly, rather strongly arcuate and equal in thickness from base to apex, just visibly longer than the prothorax in the male, but nearly one-third longer than that part in the female, the antennæ normal, with the second funicular joint about one-half longer than the third. *Prothorax* very nearly as long as wide, broadly constricted near the apex, the sides nearly parallel in basal two-thirds, the disk rather coarsely, densely punctate, the punctures two-fifths as wide as the scutellum and separated by less

than one-half of their own diameters, the median impunctate line obsolete. Scutellum small, transverse, impressed in the middle. Elytra quite distinctly wider than the prothorax and about twice as long, cylindrical and parallel in basal two-thirds, then semi-circularly rounded behind; disk with rather fine, very deep grooves, the intervals flat, equal, twice as wide as the grooves, each with a single series of small, feeble, distant and transverse punctures. The impression of the abdomen in the male is rather narrow and excessively feeble. Length 2.6–3.3 mm.; width 1.0–1.3 mm.

Iowa and Kansas, five specimens. The setæ of the elytra are small, sparse, inconspicuous and unmixed with long dispersed squamules, and by this means, as well as its more slender form, *angusta* can be separated at once from *nigrina*.

The change of name proposed by Dr. LeConte is unnecessary, as *Pseudobaris* is a genus so widely separated from *Baris*, that there cannot be a plausible possibility of its suppression.

8 ***Pseudobaris nigrina*** Say—Curc., p. 31; Ed. Lec., I, p. 295 (*Baridius*).

A very common and widely distributed species, occurring over the entire extent of the United States. It is moderately robust, oval, strongly convex, black and polished throughout, the beak strongly, evenly arcuate, slender and about one-third longer than the prothorax in the female, but stouter and only equal to the latter in the male. The prothorax is fully two-fifths wider than long, the sides broadly arcuate and convergent anteriorly, gradually becoming parallel in basal half, the apex feebly constricted at the sides; base transverse, with a very small but prominent median lobe, the disk very deeply and densely punctured, with a narrow, more or less incomplete impunctate line, the punctures rather coarse, about one-half as wide as the scutellum and almost in mutual contact. Elytra fully twice as long as the prothorax, the striæ deep but not very coarse, the intervals flat, equal, about one-half wider than the grooves, each with a single series of coarse, rather deep, rounded and not very close-set punctures, the ordinary setæ scarcely observable, the widely dispersed white squamules distinct, and condensed at the base of the third interval. Prosternum normally and abruptly sulcate. Length 2.5–3.5 mm.; width 1.0–1.6 mm.

I have before me a series of over seventy specimens, from all parts of the country, from New York and Florida (Key West), to

California (Lake Co.). The interstitial punctures sometimes become very coarse, deep and approximate, but I can perceive no such departures of structure as might call for a division into distinctly defined subspecies.

9 **Pseudobaris cælata** n. sp.—Rather broadly oval, moderately convex, polished, intense black throughout. *Head* finely, distinctly punctate toward apex, the beak coarsely, deeply, subrugosely so at the sides, evenly but not very strongly arcuate, robust, gradually flattened through apical half, short, in the female barely equal in length to the prothorax, and in the male distinctly shorter; antennæ moderate, the second funicular joint about one-half longer than the third. *Prothorax* rather short, nearly one-half wider than long, the sides subparallel and nearly straight in basal three-fourths, then strongly rounded and convergent to the apex, which is broad, truncate and very briefly subtubulate; base broadly, deeply bisinuate; disk without trace of median line, coarsely, rather densely, very deeply punctate, the punctures regular, abrupt and perforate, circular, three-fourths as wide as the scutellum and separated by much less than one-half of their own diameters. Scutellum small, transversely oval, rough, not distinctly impressed. *Elytra* about one-fourth longer than wide, nearly twice as long as the prothorax, and, at the distinctly tumid humeri, a little wider than the latter; sides distinctly convergent behind the humeri, the outline hemi-elliptical; disk not very coarsely but deeply grooved, the intervals flat, equal, about twice as wide as the striæ, each with a single series of moderately distant, coarse, transversely rugose but not very deep punctures; setæ very minute and not distinct, but mingled with long white widely dispersed squamules, distinctly condensed at the base of the third interval. *Abdomen* rather sparsely punctate, the setæ of the under surface sparse but distinct, white. Prosternum broadly, abruptly but moderately deeply sulcate, the coxæ small and separated by much more than their own width. Length 2.6–2.8 mm.; width 1.2–1.3 mm.

New Mexico (Albuquerque). Mr. Wickham.

A very distinct species, not at all closely allied to any other but assignable to the *nigrina* group, which is distinguished by the widely dispersed white squamules of the elytra. The male has the abdomen narrowly and distinctly impressed toward base. Four specimens.

#### **HESPEROBARIS** n. gen.

A single small species thus far alone represents this genus, which is allied rather closely to *Pseudobaris*. It agrees with *Pseudobaris* in general habitus, but differs in several important structural modifications of the under surface, relating especially to the form of the prosternal impression and intercoxal process, also in the structure of the antennæ. The antennæ are of the same general type as the

peculiar form distinguishing Rhoptobaris and Orthoris. The pygidium beneath emarginates the fifth segment in a rather deeply sinuous arc. In Pseudobaris the fifth segment is much less sinuate, the pygidium being but slightly visible from beneath, but in Microbaris, the latter is gradually, transversely tumid inferiorly and largely visible behind the fifth segment when viewed from beneath.

1 **Hesperobaris suavis** n. sp.—Oval, very convex, shining, black throughout, the legs rufo-piceous; setæ extremely short, visible but not conspicuous, not intermixed with dispersed squamules; sculpture rather dense. *Head* rather deeply and somewhat closely punctate, strongly convex, the transverse impression broad but strong, impunctate; beak moderately arcuate, slender, densely punctate at the sides, a little longer than the prothorax; antennæ moderate, the first joint of the funicle longer than the next three, the second exactly equal to the third, and both slightly transverse, joints two to seven cylindrically coarctate and gradually wider, club elongate-oval as long as the six preceding joints together, densely pubescent throughout, the basal joint one-third the mass and not quite as long as the second. *Prothorax* but very slightly wider than long, the apex nearly three-fourths as wide as the base; sides feebly convergent from base to apex and feebly arcuate, the apex very obsoletely constricted; base transverse, the median lobe small and extremely feeble, almost obsolete; disk with a very narrow ill-defined impunctate line, the punctures somewhat coarse, very dense, deep, one-half as wide as the scutellum and very narrowly separated. Scutellum small, transversely oval. *Elytra* one-fourth longer than wide, twice as long as the prothorax and one-fourth wider than the latter; sides almost straight and parallel in basal three-fifths, then convergent, the apex narrowly subtruncate; humeral tuberosities almost obsolete; disk with not very coarse, abrupt but shallow, opaque grooves, the intervals flat, subequal, scarcely twice as wide as the grooves and each with a single series of rounded close-set punctures, which become coarse and deep toward base but gradually very fine toward the apex. *Abdomen* coarsely, deeply punctate toward base, more finely so behind, the punctures moderately dense. Length 2.4 mm.; width 1.05 mm.

Texas (Austin); Missouri.

The type of this interesting species is a female. The specimen from Missouri is a male, and has the prothorax a little shorter and the elytral sculpture decidedly stronger.

#### MICROBARIS n. gen.

Another genus allied to Pseudobaris, necessitated by a minute species which I took some years since at Galveston, Texas. In general facies it is quite distinct from either Pseudobaris or Hesperobaris, but the small claws, connate at base, declare its relationship with these genera.



The antennæ are somewhat peculiar. They are slender, the joints of the funicle becoming but slightly wider toward apex, and with the club very small, of imperfect development and probably possessing less than the ordinary degree of sensitiveness; the several joints are not defined by distinctly traceable sutures, and the vestiture is coarse and somewhat sparse, although tolerably uniform throughout.

**1 *Microbaris galvestonica* n. sp.**—Subcylindrical, strongly-convex, polished, black throughout. *Head* minutely, the beak rather coarsely and densely punctate, the latter subimpunctate toward apex and broadly along the middle, slender, evenly, strongly arcuate and about two-fifths longer than the prothorax; antennæ slender, scape short, inserted behind the middle, funicle slender, the joints coarctate and but slightly transverse toward apex, the first not as long as the next three, the second and third subequal and each distinctly longer than wide, the fourth not at all wider than long, club small, elongate-oval, compressed, sparsely pubescent and rather shining, as long as the preceding four joints together, its structure not distinct. *Prothorax* fully two-fifths wider than long, the sides broadly, strongly arcuate in basal half, becoming strongly convergent and straight but not in the least constricted toward apex, the latter one-half as wide as the base, feebly arcuate; base transverse, the median lobe broad and very feeble; disk wider at basal third than at base, with a very narrow ill-defined impunctate line, the punctures moderately large, about one-half as wide as the scutellum and dense but not polygonally distorted. Scutellum very small, rounded. *Elytra* one-half longer than wide, a little more than twice as long as the prothorax and very slightly wider than the disk of the latter, cylindrical in basal two-thirds, then gradually, parabolically rounded, the humeral tuberosities obsolete; disk with extremely fine but deep and abrupt impunctate striæ, the intervals flat, subequal, four or five times as wide as the striæ, each with a single series of very minute remote and feeble punctures, each bearing a small but distinct subrecumbent silvery seta. *Abdomen* not very finely, strongly but rather sparsely punctured. *Legs* short, moderately slender. Length 1.6 mm.; width 0.65 mm.

Texas (Galveston).

A single specimen, the sex of which is somewhat doubtful.

### TRICHOBARIS.

LeConte—Proc. Am. Phil. Soc., XV, p. 287.

The genus defined under this name by LeConte is one of the most highly specialized of the present group of Barini. It is not at all closely allied to *Pseudobaris*, although assigned at the present time to the section containing that genus because of the similarity in structure of the tarsal claws; these differ somewhat, however, in being occasionally slightly unequal in length. It has no special

affinity with *Rhoptobaris*. The squamose vestiture so highly developed in the *Centrini* is also one of the most characteristic features of *Trichobaris*, giving it a peculiar and easily recognized aspect among the semi-glabrous genera with which it must be associated, for it is easily distinguishable from *Pycnobaris* by its oblong form. The elongate parallel outline of the body is however not peculiar to this genus, being exhibited equally well in *Stictobaris*.

In *Trichobaris* the prosternum is broadly and feebly impressed along the middle and narrowly separates the coxæ, the formation of these parts being nearly as in *Baris*. The scutellum is large, strongly transverse, broadly, deeply impressed and with the sides acutely angulate, occasionally being prominent and more or less reflexed toward apex or corniform, a development especially characteristic of the present genus, although suggested rather strongly in the first section of *Baris*.

The vestiture consists of broad scales, sometimes both above and beneath, but often replaced by long slender squamules on the upper surface; they are always recumbent and often subdenuded in various limited areas, especially in two small spots at the base of the pronotum, in two large subconfluent areas at the sides of the prothorax beneath, and, in *mucorea*, also in three small spots at the base of the beak; these spots are not really denuded, but are clothed with smaller and more slender piceous-black squamules. On the abdomen there is always a large subquadrate area more or less completely glabrous, occupying the median portions of the two or three last segments; this is independent of the sex of the individual.

The antennal club varies in structure nearly as in *Plesiobaris*, enabling us to group the species as follows:—

Antennal club moderately large, much longer than wide, with the basal joint constituting less than one-half of the mass; vestiture variable but with the squamules always oblique at the sides of the elytral intervals; body generally subdepressed above, the prothorax always more or less quasi-denuded beneath at the sides.

Vestiture of the upper surface consisting of slender squamules, which do not completely conceal the sculpture.

Pronotum simply punctate, without impunctate and subcarinate median line; antennal club robust and abrupt.....1 **trinotata**

Pronotum densely and confluent punctate, sometimes longitudinally rugose, the sides more or less feebly sinuate just behind apical third; antennal club more slender and elongate, less abrupt, the outer funicular joints more transverse; pronotum with a narrow impunctate median carina; size larger, the vestiture denser.....2 **mucorea**

- Vestiture consisting of large, broad, moderately dense scales; punctures of the pronotum large, deep, circular and distinct, with a narrow carinate impunctate line; basal denuded spots not distinct.....3 **insolita**
- Antennal club more robust and conoidal, shorter and with the basal joint constituting one-half of the mass; vestiture consisting of more or less broad scales, more densely placed, not conspicuously oblique at the sides of the elytral intervals; body more convex, the prothorax never with subdenuded spots at the sides beneath.
- Abdominal impression of the male normally clothed with long recumbent scales; body very robust; basal denuded spots of the pronotum large and distinct.....4 **compacta**
- Abdominal impression of the male bristling with erect robust and pointed hairs; body narrow and subcylindrical; basal subdenuded spots of the pronotum almost completely obsolete.
- Antennal club robust, much wider than the outer joints of the funicle; anterior coxæ separated by about one-third of their own width; elytral striæ indicated by narrow partings of the vestiture.....5 **texana**
- Antennal club exceedingly small, scarcely wider than the outer joints of the funicle; anterior coxæ separated by one-half of their own width; elytral striæ totally obliterated by the vestiture, the latter excessively dense and composed of much broader scales; body still narrower.

6 **cylindrica**

1 **Trichobaris trinotata** Say—Curc., p. 17; Ed. Lec., I, p. 280; *vestita* Boh., Sch. Gen. Curc., III, p. 718 et Klug, i. litt.; *tripunctata*, Chev. i. litt. (Baridius); *cinerea* Dej. i. litt. (Baris); *pennsylvanica* Knoch, i. litt. (Curculio); *plumbea* Lec., Proc. Acad. Nat. Sci., Phila., 1868, p. 364 (Baridius).

Oblong, parallel, moderately narrow, black throughout, rather dull in lustre and uniformly clothed with long fine hair-like recumbent squamules, pure white in color, but rather sparse and producing merely a grayish pruinose appearance, the scales at the sides of the elytral intervals strongly evenly and posteriorly oblique. Beak densely punctate, fully as long as the prothorax in the male, a little longer and rather slender in the female, the antennal club robust, oval, densely pubescent, as long as the five preceding joints in the former sex, but a little shorter in the latter, the basal joint but slightly more than one-third the total length, the second funicular joint one-half longer than the third. The male is generally larger than the female, and, in both sexes, the median parts of the third and fourth ventral segments are abruptly denuded. The prosternum is rather narrowly but distinctly impressed along the middle, the anterior coxæ being separated by about one-fourth of their own width. Length 3.0–4.4 mm.; width 1.2–1.75 mm.

Pennsylvania to Florida (Key West), Illinois, extending south-

ward to Texas. There is considerable doubt in my mind as to the real identity of the Mexican species described by Boheman as *vestita* with the true *trinotata* of Say, the species are mutually so similar that they are liable to be confounded unless carefully compared. *Plumbea* Lec. seems to be identical with this species.

2 **Trichobaris mucorea** Lec.—Proc. Ac. Nat. Sci., Phila., 1858, p. 79 (Baridius).

Much larger and broader than *trinotata*, the vestiture rather more robust and much closer but not extremely dense, white, the squamules long and slender, directed transversely on the pronotum and oblique and interlacing along the sides of the elytral intervals, becoming large and reddish-yellow along the anterior margin of the pronotum, broad and overlapping beneath and replaced by very slender dark piceous squamules in a large spot involving almost the entire flanks of the prothorax beneath, and in three small spots at the sides and on the upper surface of the beak near the base, these areas appearing as if denuded; abdomen abruptly denuded at the middle of the third and fourth segments. Head glabrous; beak densely squamulose, the antennæ stout, with the second funicular joint longer than wide and one-half longer than the third, club rather large, elongate, conoidal, extremely densely clothed with fine short piceous hairs, the basal joint constituting one-third of the mass. Anterior coxæ separated by one-third of their own width. Male with the abdomen broadly, feebly impressed in basal half, the vestiture of the impression unmodified, consisting of large closely recumbent scales; fifth segment with a short broadly rounded apical lobe at the middle. Length 5.0–6.0 mm.; width 2.3–2.6 mm.

Southern and Lower California and Arizona. Differs very widely from *trinotata*, but perhaps identical with Boheman's *vestita*. It is recognizable at once by its rather depressed upper surface, large size and the subdenuded area at the sides of the prothorax beneath.

Two of the specimens before me are smaller, with the vestiture decidedly sparser, and with the pronotum strongly, longitudinally rugose, and another much larger, with coarse and distinct pronotal rugæ, but with the vestiture denser than usual; this is therefore an exceptionally variable species, or else I have confounded several very closely allied forms, which cannot be advantageously studied with such small series of specimens.



3 **Trichobaris insolita** n. sp.—Oblong-oval, somewhat robust and distinctly depressed, black throughout, the integuments polished when denuded but densely clothed with large broad recumbent whitish scales. *Head* polished, glabrous, minutely, sparsely and obsoletely punctate, the transverse impression strong and normal; beak only moderately robust, evenly, rather strongly arcuate, abruptly very strongly bent at base at the junction with the head, deeply punctate, squamose especially at the sides, fully as long as the prothorax in the female; antennæ rather slender, the scape but slightly shorter than the funicle, the second joint of the latter much longer than wide and one-half longer than the third which is quadrate, fourth a little wider than long, outer joints but slightly thicker, the club small but longer than wide and rather abrupt, conoidal, densely clothed with robust recumbent cinereous squamules, the basal joint constituting a little less than one-half the mass. *Prothorax* short, about one-half wider than long, the sides subparallel or very feebly convergent and nearly straight to apical third, then broadly rounded and moderately convergent but scarcely at all constricted to the apex, which is fully one-half as wide as the base, transversely truncate; base broadly bisinuate; disk with a narrow entire cariniform impunctate line, the punctures round, deep, perforate moderately large and mutually quite distinctly separated. *Scutellum* well developed, transverse, broadly impressed, the sides acute, prominent, slightly flexed posteriorly and corniform. *Elytra* two-fifths longer than wide, one-fourth wider than the prothorax and nearly two and one-half times as long as the latter; sides subparallel and straight, the humeri scarcely prominent, the apex broadly rounded and subtruncate, each elytron strongly callous in the middle at apical fourth: striae rather fine but deep and abrupt, the intervals flat, three times as wide as the grooves, rather finely confusedly and moderately closely punctate when denuded. *Prosternum* feebly impressed, the coxæ separated by nearly one-half their width. *Legs* moderate; tarsal claws short, connate for one-half their length, parallel, slightly everted toward apex and quite distinctly unequal in length. Length 4.2 mm.; width 1.8 mm.

#### Florida.

A single female example collected in the extreme southern part of the State by Mr. Francis Kinzel, and kindly given to me by Mr. Jülich. It is somewhat intermediate between the *texana* and *trinotata* groups of the genus, but is widely distinct from any other species. The scales are shorter broader and larger than in any other form known to me, not even excepting *cylindrica*, some of those on the under surface of the prosternum being only slightly longer than wide. The median parts of the third and fourth ventral segments are abruptly glabrous, the normal scales being replaced toward the apex of each by very minute slender squamules sparsely distributed.

4 **Trichobaris compacta** n. sp.—Oblong, strongly convex, robust, black, densely clothed throughout with long white moderately wide recumbent scales, which are not distinctly oblique at the sides of the elytral intervals, the scales not quite in mutual contact on the upper surface but very nearly so, broad, denser and conspicuous throughout the under surface, excepting the usual abruptly glabrous spot at the middle of the third and fourth ventral segments. *Head* glabrous, minutely, sparsely punctate; beak robust, short moderately arcuate, very densely and evenly squamose throughout, distinctly shorter than the prothorax in both sexes; antennæ stout but long, the second funicular joint longer than wide, obconical one-half longer than the third, outer joints transverse, the club robust, conoidal, pointed, as long as the four preceding joints combined, slightly pale in color, very densely clothed throughout with small robust subrecumbent squamules, which are white on the basal half, fulvous thence to the tip, the basal joint constituting about one-half the mass, the annulations not very distinct. *Prothorax* two-fifths wider than long, the sides feebly convergent and often broadly sinuate to apical third, then strongly rounded and subprominent, thence strongly convergent and broadly constricted to the apex; disk with the two basal subdenuded spots large and distinct, the scales directed transversely. *Scutellum* short, very transverse, broadly impressed, glabrous, corniform at the sides. *Elytra* rather shorter and broader than usual, scarcely more than one-fourth longer than wide, abruptly one-fourth wider than the prothorax and a little more than twice as long as the latter; sides parallel and straight; apex abruptly, broadly rounded; striæ simply indicated by fine partings of the vestiture. *Prosternum* feebly impressed, separating the coxæ by one-third of their own width. Length 4.5–5.3 mm.; width 2.0–2.6 mm.

Southern California; Arizona.

Of this distinct species I have before me a series of about fifty specimens. It may perhaps be confounded at first sight with *mucorea*, but is shorter and stouter, the upper surface more convex and the sides of the prothorax less acutely prominent. The scales are broader and denser and are not replaced by piceous squamules at the sides of the prothorax beneath, and are not oblique, or only feebly and accidentally so, at the sides of the elytral intervals. The male has a broad feeble and normally squamose impression in basal half, and the fifth segment is as long as the two preceding combined, with a small shallow emargination at the apex, from the bottom of which there projects a short dentiform lobe, analogous to that of *Desmoglyptus crenatus*.

5 **Trichobaris texana** Lec.—Proc. Am. Phil. Soc., XV, p. 288.

Parallel, somewhat similar in outline to *trinotata*, but much more densely clothed with yellowish-cinereous scales, which are broader, with the basal denuded spots of the pronotum almost completely

obsolete. The beak in the male is quite distinctly shorter than the prothorax, the antennæ stout, the second and third funicular joints equal and slightly wider than long, the outer joints becoming extremely wide and subcontinuous in outline with the club, the latter small but thick, only slightly longer than wide, conoidal, densely pubescent, the basal joint constituting rather more than one-half the mass. Prothorax scarcely one-third wider than long, with the sides straight and parallel to apical third, then broadly rounded and convergent and somewhat constricted to the apex; disk deeply, very densely punctate, without impunctate line. Elytra a little wider than the prothorax and about two and one-third times as long, parallel, abruptly and broadly rounded at apex, the sculpture and striation concealed by the vestiture, the striæ feebly indicated by fine partings of the scales, which are not oblique along the sides of the intervals. Prosternum distinctly impressed, separating the coxæ by about one-third of their own width. Length 4.3–5.1 mm.; width 1.75–2.0 mm.

Texas and Colorado. The third and fourth ventral segments are denuded toward base in the middle, and, in the male, there is a large elongate flattened or very feebly impressed area in basal half, extending substantially to the base, in which the normally recumbent scales become longer, more slender, stiff and semi-erect setæ; there is also a small spot in the middle of the fifth segment in which the vestiture is similarly modified.

6 **Trichobaris cylindrica** n. sp.—Parallel, subcylindrical, convex, very narrow and elongate, black; integuments concealed above by an excessively dense covering of large wide strigose scales, the denuded pronotal spots feebly indicated on the basal margin only, the scutellum glabrous. Head glabrous, opaque, almost impunctate, the transverse constriction very strong but not grooved and caused, as usual, by the pronounced gibbosity at the base of the beak, the latter strongly, evenly arcuate, moderately robust, densely squamose, scarcely as long as the prothorax in the male, the antennæ nearly as in *texana* but less stout. Prothorax one-fourth wider than long in the male, but still longer in the female, constricted near the apex, the sides broadly rounded, gradually becoming parallel and nearly straight in basal half; base transverse, broadly bisinuate; disk evenly, extremely densely punctate, without trace of median line, the surface completely concealed by the large transversely directed scales, which are in mutual contact. Scutellum moderate, transverse, broadly, deeply impressed but not so acute and prominent at the sides as in *texana*. Elytra a little wider than the prothorax and nearly two and one-half times as long, parallel, abruptly and broadly rounded at apex, the pygidium feebly oblique and visible behind, the humeri slightly

prominent; disk completely concealed by a covering of large contiguous scales, which are not even finely parted along the striae. *Abdomen* densely squamose, middle parts of the third and fourth segments glabrous toward base only. Prosternum not distinctly impressed, separating the small coxæ by fully one-half of their own width. Length 3.5–4.7 mm.; width 1.3–1.7 mm.

#### Arizona.

Somewhat allied to *texana*, but quite different in its still narrower, cylindrical form and denser vestiture, larger suboval scales which are in close contact throughout, in the smaller and more distant anterior coxæ and less impressed prosternum.

In the male there is, at basal third of the abdomen, a small elongate-oval flattened area in which the scales become bristling semi-erect and acutely pointed setæ.

Several specimens before me are almost completely denuded, and the pronotal punctures are readily observed to be fine deep and frequently subcoalescent in a longitudinal direction, but not forming rugæ like those occasionally seen in *mucorea*, in which species also the sculpture of this part is much coarser. Anteriorly the constriction which is really strong, although not very distinct when normally squamose, is traceable entirely across the dorsal surface, the sculpture in the constriction consisting of strong, longitudinal and coarser rugiform ridges.

### RHOPTOBARIS.

LeConte—Proc. Am. Phil. Soc., XV, p. 287.

The single species constituting this genus has nearly all the generic characters of *Orthoris*, but seems to differ sufficiently in the form and structure of the beak, prosternum and scutellum to fully warrant its generic isolation.

The beak is rather robust, moderately and evenly arcuate, differs considerably in the two sexes, and is separated from the head by an extremely broad and feeble transverse impression. Epistomal lobe short, limited at each side by a very small oblique fissure, and narrowly and deeply sinuate at the apex. Antennæ somewhat slender, the club elongate-ovoidal, densely pubescent and indistinctly annulate, the basal joint composing about one-third of the mass. The mandibles are well developed, arcuate, decussate when closed and deeply notched at apex.

The prosternum is flat, not distinctly tumid before the coxæ and separates the latter by one-third of their own width. Prothorax at



base quite perceptibly narrower than the elytra. Scutellum triangular, flat, nearly as long as wide, deeply and densely sculptured like the surrounding surface of the elytra and not impressed. The legs are moderately long, the tarsi slender, the unguis well developed and unusually thick, as in *Orthoris*.

The oblique pygidium of *Rhoptobaris* and *Orthoris* appears to indicate a certain affinity with the *Centrini*, and, although this character occurs also in the *Barini* proper, it would seem more natural to place these genera as near the *Centrini* as possible. The elongate antennal club, also, is more of a *centrinide* than a *baride* character, it being highly developed for example in *Cylindrocerus*.

1 ***Rhoptobaris canescens*** Lec.—Proc. Am. Phil. Soc., XV, p. 287.

Elongate-oval, black throughout and strongly convex, subopaque, the elytra less densely sculptured and a little more shining, the vestiture consisting of very short, moderately dense setæ, giving a gray pruinose appearance to the surface. The beak is rather stout, distinctly arcuate, one-third longer than the prothorax in the male, but nearly one one-half longer than the latter in the female and distinctly more slender; antennæ inserted slightly beyond the middle, the funicular joints small and subequal, the club elongate, fusiform, abrupt, very densely pubescent, not distinctly annulate, a little shorter than the funicle in the male, but fully as long as the latter in the female. Prothorax in the male two-fifths wider than long with the sides strongly convergent from base to apex and evenly moderately arcuate throughout, not in the least constricted, in the female scarcely perceptibly wider than long, the sides being very feebly convergent from base to apex; disk without impunctate line, finely and very densely punctate throughout. Elytra in both sexes abruptly and quite distinctly wider than the prothorax, and, in the male, nearly three times as long as the latter, in the female not quite two and one-half times longer, the striæ deep and abrupt, not very coarse, the intervals about three times as wide as the striæ, finely, confusedly and very densely punctate throughout. The male is much larger and more robust than the female, and has, at the apex of the fifth segment, a short obtusely rounded dentiform lobe. Length 3.4–4.0 mm.; width 1.3–1.6 mm.

Colorado. Of the habits of this interesting species I believe nothing has been recorded.

**ORTHORIS.**

LeConte—Proc. Am. Phil. Soc., XV, p. 286.

The external appearance of the species composing this genus certainly conveys but little idea of their true affinities, for, as remarked by Dr. LeConte, they quite closely resemble *Orchestes*. *Rhoptobaris* constitutes, however, an excellent connective bond in every way with the more usual habitus of the tribe.

There are several inaccuracies in the original diagnosis of the genus, which is drawn from the female alone. The beak is stated to be "not curved," and the prosternum "broadly though not deeply sulcate in front." The beak, even in the very long slender form occurring in the female of *crotchii*, is feebly, though very sensibly, curved, and in the male of *crotchii* and female of *cylindrifer*, it becomes quite conspicuously so. The modification of the prosternum is peculiar, this part being rather narrowly and deeply impressed along the middle, but not at all abruptly sulcate; the peculiarity consists in the fact that the canaliculation is not a depression below the general surface of the prosternum as in other genera, but is caused by a tumid elevation before each coxa, the impression being an intervening valley between the two prominences.

The beak in *Orthoris* is slender and separated from the head by a transverse impression, which is narrower and much stronger than in *Rhoptobaris*; but in the structure of the prostomal lobe and mandibles the two genera are nearly similar. The antennæ are of the same aberrant type as in *Rhoptobaris*, the club being sometimes greatly elongate, a form feebly suggested in the genus *Hesperobaris*. The front coxæ are very narrowly but distinctly separated.

Our two species may be easily recognized as follows:—

Lustre alutaceous; setæ longer, confusedly dispersed on the elytral intervals; pronotal punctures finer and dense; beak in the female very long and slender, the antennal club in that sex not quite as long as the funicle.

**1 crotchii**

Lustre polished; setæ shorter, much sparser and more rigid, arranged in a single line on each interval; pronotal punctures rather coarse and not so dense; beak in the female much shorter and more arcuate, the antennal club distinctly longer than the entire funicle .....2 **cylindrifer**

**1 Orthoris crotchii** LeConte—Proc. Am. Phil. Soc., XV, p. 286.

Moderately short and stout, convex, black throughout and somewhat dull in lustre, the setæ rather long, subrecumbent, flexible,

moderately sparse but very conspicuous, confusedly arranged on the elytral intervals. Beak differing greatly in the sexes, very slender, just visibly but evenly arcuate and three-fifths longer than the prothorax in the female, stouter, much shorter and distinctly arcuate near the base and apex in the male, the antennal club in the female scarcely perceptibly shorter than the entire funicle, but not much longer than the preceding six joints in the male. The prothorax is small, conical, truncate at apex and very feebly constricted anteriorly, the punctures scarcely more than one-fourth as wide as the scutellum and separated by barely one-half of their own widths. Elytra abruptly fully two-fifths wider than the prothorax, two and one-half times as long as the latter, one-third longer than wide; sides parallel and straight, the apex broadly and abruptly rounded, the striae deep; intervals three to four times as wide as the striae, finely and feebly, not very densely, confusedly and subasperately punctate. Fifth ventral segment longer than the preceding two combined, acutely rounded in the female, a little more obtuse in the male. Anterior coxæ separated by nearly one-fourth of their own width. Length 2.8–3.8 mm.; width 1.1–1.65 mm.

California; Texas; Nebraska (Pine Ridge). In the extensive series before me the largest and smallest specimens are both females.

**2 *Orthoris cylindrifer*** n. sp.—General form as in *crotchi*, but polished and more sparsely setose, the setæ moderately long, stiff, erect and bristling on the beak and pronotum, but recurved on the elytra, forming a nearly even single line on each interval. Head coarsely punctured, setose, the transverse impression narrow, strong and impunctate, the beak moderately densely punctate, rather slender, strongly arcuate at base and near the apex, somewhat short, scarcely more than one-third longer than the prothorax in the female; antennæ long, the first funicular joint robust and as long as the next three, two to seven small, subequal, club very long, fully three times as long as wide, one-half as long as the prothorax and fully one-third longer than the entire funicle, abruptly wider than the seventh funicular joint, the sides straight and subparallel or very feebly divergent thence to apical third, then gradually pointed, indistinctly annulate, the basal joint longer than wide. Prothorax small, nearly one-half wider than long, the sides convergent from the base, feebly but distinctly arcuate, very obsoletely constricted near the broadly truncate apex; base with a small but distinct median lobe; disk rather coarsely and not densely punctate, the punctures almost one-third as wide as the scutellum and very deep. Scutellum moderate, transversely subquadrate. Elytra abruptly one-half wider than the prothorax, nearly as in *crotchi*, except that the intervals are polished, quite distinctly convex and each with a single uneven series of small subrugulose feeble and rather dis-

tant punctures. *Abdomen* sparsely punctate, strongly convex. Prosternum separating the coxæ by barely one-fourth of their width. Length 3.0–3.3 mm.; width 1.2–1.5 mm.

#### Arizona.

The description is drawn from the female, the only sex which I have seen. The extraordinary development of the antennal club and shorter beak will at once distinguish the present species from *crotchi*. Two specimens.

### CENTRINUS.

Schönherr—Curcul. Disp. Meth., p. 308.

Within the wide limits permitted by the short and somewhat ambiguous definition of Schönherr, I here regard as *Centrinus*, those species of Barini which have the pygidium concealed in both sexes, or never with more than the mere tip exposed, the femora unarmed, the mandibles elongate, prominent, not in the least decussate when closed, with the inner edge entirely free from notches and denticulation, and the tarsal claws free and divergent. In addition, it should be stated that the species are, with very few exceptions, rhomboidal or rhomboid-oval to a greater or less degree, and are all more or less squamose. This definition, also, will at least not exclude those species defined as *Centrinus* by Pascoe (Ann. Mag. Nat. Hist., Oct. 1889, p. 322) viz: "Claws free; canal nearly obsolete or absent; anterior coxæ separated; prosternum lower than the coxæ; elytra broader than the prothorax."

With these characters are associated others, even in our own somewhat limited fauna, of considerable variety. The beak may be very slender, comparatively robust, or slender and inflated near the base, strongly and evenly or feebly and unevenly arcuate and variously compressed and flattened, the antennæ inserted beyond or behind the middle and the prothorax tubulate or not. The anterior coxæ may be narrowly or quite widely separated, the prosternum flat or variously impressed, foveate or sulcate, often very differently modified in these respects in the sexes of the same species. Finally, the secondary sexual modification of the male may be radically different in kind, consisting either of short or long ante-coxal corneous processes of the prosternum, or of a dentiform extension of the anterior trochanters, or of a short erect tooth-like process projecting from the inner side of the basal joint of the antennal club, never, however, by a combination of any of these three modifications; in



some cases, the male appears to be entirely devoid of secondary sexual characters.

In fact within the limits of the genus as thus defined by mandibular structure, many characters which are of generic importance elsewhere, such as the degree of separation of the coxæ, nature of the prosternal impression and conformation of the prothoracic apex, lose all significance of this kind and are merely useful in defining groups. In all probability some of these sexual groups are worthy of a separate designation, but with my present lack of sufficiently exact knowledge concerning the numerous tropical forms, it would be manifestly inappropriate to do more than simply indicate those which exist within our own fauna; this has been attempted in the following table:—

Male with an erect or oblique process of greater or less length before each anterior coxa; antennal scape not attaining the eye; tarsal claws slender, not excavated beneath.

Anterior coxæ narrowly separated; body robust.

Beak thick, the antennæ inserted beyond the middle, at least in the male; prothorax strongly tubulate at apex .....**I**

Beak very slender, the antennæ inserted far behind the middle in both sexes, with the scape very short, coming far from attaining the eyes; much smaller species .....**II**

Anterior coxæ widely separated, the beak moderately slender, often more or less inflated toward base in the female, the antennæ inserted at a greater or less distance behind the middle .....**III**

Male with two short arcuate prosternal processes; anterior coxæ rather widely separated, the prosternum flat, with a small subapical excavation; mandibles aberrant, small, widely separated, the inner edge outwardly oblique and broadly arcuate toward apex, deeply notched externally beneath; tarsal claws aberrant, long, stout, widely divergent, excavated beneath throughout their length; elytra with quasi-denuded transverse interrupted bands .....**IV**

Male without trace of prosternal or antennal modification, but with the anterior trochanters dentate; anterior coxæ moderately separated, the prosternum flat; beak somewhat stout, the antennæ inserted a little behind the middle, the club of peculiar structure, the two basal joints together comprising but slightly more than one-half the mass, the first often much shorter than the second .....**V**

Male entirely devoid of secondary sexual modification of the antennæ, prosternum or trochanters.

Anterior coxæ rather widely separated.

Prothorax subtubulate at apex; elytral vestiture quasi-denuded in small spots; beak slender, rather feebly arcuate, the antennæ inserted behind the middle in both sexes, the scape rather long and almost attaining the eye; tarsal claws long, normal in structure .....**VI**

Prothorax completely non-tubulate; elytral and pronotal vestiture disposed in dense sharply-defined longitudinal lines; beak slender, excessively arcuate, the antennæ inserted behind the middle, the scape very short and extending only two-thirds the distance thence to the eyes... **VII**

Anterior coxæ narrowly separated.

Beak slender, with the antennæ inserted behind the middle, dissimilar in the sexes, shorter, almost evenly arcuate and cylindrical in the male, longer, nearly straight but abruptly bent near the base and broadly, gradually flattened toward apex in the female; prosternum not impressed, but with a small subdenuded point, from which the scales radiate in all directions; scutellum very small, rounded, glabrous; vestiture more or less uneven ..... **VIII**

Beak rather stout and cylindrical, the antennæ inserted beyond the middle, the scape extending almost to the eye ..... **IX**

Male without secondary sexual modification of the prosternum or trochanters, but having the outer joints of the antennal funicle obliquely truncate and often prominent internally, and the basal joint of the club with a large glabrous area on the inner side, at the middle of which there is a tumid or dentiform process; pygidium with the apical portion exposed in both sexes; anterior coxæ narrowly separated, the prosternum generally with a deep transversely oval pit behind the apical margin; basal impression of the beak almost obsolete; scutellum rather large and always densely albido-pubescent ..... **X**

The species are numerous and are equally abundant in South America; they are generally small and most of the large Brazilian forms will have to be assigned to other diverse genera. Those of the United States may be thus distinguished:—

#### Subgenus I.

Elytral intervals alternately more densely punctured and pubescent.

Pronotal punctures rather coarse, deep, rounded, not at all coalescent; beak in the male barely as long as the head and prothorax and very thick, especially toward base ..... **1 punctirostris**

Pronotal punctures finer, subcoalescent longitudinally; beak in the male much smoother in apical half, more slender, less distinctly robust toward base and fully as long as the head and prothorax ..... **2 lævirostris**

Elytral intervals narrower, all coarsely, sparsely and rugosely punctate; body shorter and more broadly oval; upper surface sprinkled with large, widely distant, white scales.

Prosternal processes of the male moderately long; scattered scales of the elytra long and narrow; pronotum with oblique, interrupted rugæ and coarse punctures ..... **3 striatirostris**

Prosternal processes in the form of very feeble cusp-like elevations of the anterior margin of the coxal cavity; scattered scales of the elytra broad and oval.

Pronotum coarsely, sparsely punctate, the punctures feebly tending to coalesce obliquely; body obese .....4 **modestus**

Pronotum completely impunctate, but with long deep and oblique rugæ throughout; body much narrower.....5 **tortuosus**

Subgenus II.

Body robust, rather less densely clothed above with elongate slender squamules, which are generally ochreous-yellow in color, occasionally a little wider and nearly white; basal joint of the antennal funicle almost as long as the next four together in the female.....6 **picumnus**

Body smaller and narrower, rather more densely clothed above with broader, oval, white scales; basal joint of the funicle shorter, about as long as the next three in the female; beak a little shorter .....7 **albotectus**

Subgenus III.

Beak long, slender, thicker toward base, especially in the female and generally about one-half as long as the body.

Vestiture of the upper surface consisting of paler and darker squamules, confusedly intermingled, with two small subapical quasi-denuded spots.

Paler scales ochreous-yellow in color; slightly smaller and stouter species, the prosternum perfectly flat in the female .....8 **neglectus**

Paler scales whitish; prosternum broadly, feebly impressed in both sexes; beak in the female much more strongly, but not very abruptly, inflated toward base.....9 **grisescens**

Vestiture of the upper surface dense and uniform throughout; subapical dark spots totally obsolete.

Integuments black, densely clothed with white or yellowish-white squamules.

Scutellum minute.

Scutellum flat, sparsely squamose; beak in the female but very feebly and gradually thicker toward base; vestiture cinereous-white .....10 **perscillus**

Scutellum polished, with a broad deep glabrous impression along the middle, the apex emarginate; beak in the female very much thicker and more arcuate toward base, but gradually so; prothorax much shorter than in *perscillus*; vestiture uniform ochreous-yellow or whitish.....11 **finitimus**

Scutellum much larger, flat, densely squamose; vestiture white; beak in the female abruptly and strongly inflated behind the point of antennal insertion, extremely slender thence to the apex .....12 **hospes**

Integuments pale testaceous, the vestiture ochreous-yellow; legs still paler, rufous .....13 **clarescens**

Beak decidedly short and thick in both sexes, cylindrical and nearly equal in diameter from base to apex, barely as long as the head and prothorax; integuments rufous or rufo-piceous; antennæ with the funicular joints two to seven much shorter.

- Smaller species, the pronotal punctures very dense and polygonally crowded; squamules of the elytra and median parts of the pronotum fine, with widely dispersed, larger and paler scales .....14 **perscitus**  
 Larger and much broader species, the pronotal punctures smaller, less closely crowded, the elytral squamules longer, denser, paler and without distinct widely dispersed scales .....15 **exulans**

## Subgenus IV.

GERÆUS Pasc.

- Narrowly rhomboidal, the elytra with two transverse dark bands interrupted at the suture; scutellum moderately densely squamose; setæ borne by the stria punctures long, white and almost as large as those of the intervals .....16 **senilis**

## Subgenus V.

- Beak in the male fully as long as the head and prothorax; antennæ long and very slender; the club narrow, elongate and densely pubescent.

17 **acuminatus**

- Beak in the male scarcely longer than the prothorax; antennæ shorter and much stouter, the club very large, broadly oval, subglobose and sparsely pubescent .....18 **globifer**

## Subgenus VI.

- Narrowly rhomboidal, densely clothed with narrow ochreous scales, the elytra with several more or less unstable dark spots in apical two-thirds, which are clothed with piceous-black squamules .....19 **penicellus**

## Subgenus VII.

- Rather broadly oval, the humeri not prominent; pronotum with three broad yellow vittæ, the elytra lineate with yellow and black; scutellum small, glabrous, polished; prosternum not impressed, but with a small discal point from which the scales radiate as in the following group.

20 **lineellus**

## Subgenus VIII.

- Elytral squamules very fine, white, disposed in two somewhat even lines on each interval; legs blackish to dark rufo-piceous.

- Elytral squamules uniform throughout, slightly broader only near the scutellum; form narrowly rhomboidal .....21 **capillatus**

- Elytral squamules much coarser on intervals two to four, for a short distance behind the middle, forming a cloud-like spot; form more broadly rhomboid-oval .....22 **nubecula**

- Elytral squamules coarser, uneven in size, yellowish; legs bright rufous.

23 **clientulus**

## Subgenus IX.

- Form rather narrowly oval, scarcely at all rhomboidal, the humeral callus small and but slightly prominent; prothorax rather short and transverse,



abruptly narrowed near the apex, the punctures fine, extremely dense and longitudinally subconfluent; vestiture uniform, ochreous, the squamules slender.....24 **falsus**

Subgenus X.

ODONTOCORYNUS Schönh.

Group I.

*Beak nearly similar in form in the male and female.*

Antennæ inserted beyond apical third in the male and at apical two-fifths in the female; body rhomboid-oval, sparsely squamose, more or less rufescent in the female, the male black.....25 **scutellum-album**

Group 2.

*Beak compressed, strongly punctate and abruptly bent near the base in the male, but cylindrical, polished, almost impunctate and more evenly arcuate in the female.*

Squamules borne by the stria punctures of the elytra inconspicuous.

Pronotal punctures larger, distinct, close but not densely crowded.

Larger species, the antennal club robust; punctures of the elytral intervals coarse and rounded, distinctly defined, each deeply enclosing a small white scale..... 26 **denticornis**

Smaller species, less robust and more parallel, the antennal club smaller; interstitial punctures closer and confused.....27 **salebrosus**

Pronotal punctures small, extremely densely crowded; antennæ rufescent, the club large and robust; body broadly oblong..... 28 **pinguescens**

Squamules borne by the stria punctures broad and distinct.

29 **pulverulentus**

The identity of subgenus "X" with *Odontocorynus* Sch., is inferred from the description given by Lacordaire. We have no species in which the antennal joints four to seven are internally spinose, but several in which the two or three outer joints of the funicle are slightly prolonged and acuminate within. The Mexican *Centrinus larvatus* and *tonsilis* of Boheman, also belong to this subgenus without doubt.

I.

1 **Centrinus punctirostris** Lec.—Proc. Am. Phil. Soc., XV, p. 309.

Very robust, oval, convex, piceous-black, the elytra, beak, antennæ and legs more or less rufescent; vestiture consisting of large whitish scales, denser toward the sides of the pronotum and also, to some extent, on the wider of the elytral intervals, giving a subvittate appearance; under surface densely squamose. Beak decidedly thick, moderately arcuate, about as long as the head and prothorax, rather coarsely, deeply punctured, but densely and rugulose only at

the sides toward base; antennæ inserted at the middle, the second funicular joint three-fifths as long as the first; club abrupt, rather large, very robust, densely pubescent, with the basal joint composing fully one-half of the mass. Prothorax fully one-third wider than long, the apex tubulate and two-fifths as wide as the base; punctures rather large, deep, circular, close but not in actual contact, the smooth impunctate line distinct. Elytra large, quite distinctly wider than the prothorax and about twice as long, the sides just visibly convergent from the humeri to apical third, then gradually and broadly rounded and strongly convergent, the apex acutely ogival; disk with moderately coarse, abrupt striæ, the intervals flat, alternating wide and narrower, the wide intervals, beginning with the first, rather finely, extremely densely punctate, the narrower more coarsely and not so closely so, the punctures all distinct. Prosternum in the male with an oval and excessively deep pit between the corneous processes, the latter very robust, somewhat long, gradually arcuate and inclined forward from the base, obtusely acuminate at apex and not quite as long as in *lævirostris*; anterior coxæ separated by about one-third of their own width. Length 5.6 mm.; width 2.7 mm.

Colorado. Cab. LeConte. This interesting species is represented by the unique male type only.

2 **Centrinus lævirostris** Lec.—Proc. Am. Phil. Soc., XV, p. 309.

Robust, oval, convex, piceous, the integuments moderately shining, somewhat densely clothed with elongate-oval whitish scales on the pronotum in the middle through basal half and toward the sides, but elsewhere sparsely covered with fine and darker squamules; on the elytra the white scales are dense on the alternate intervals beginning with the first, least conspicuously so on the third, the other intervals more sparsely clothed with slender and darker scales; under surface densely clothed with large white scales. Beak in the male moderately slender, smooth, only deeply and rugulose punctured at the sides toward base, moderately and evenly arcuate and fully as long as the head and prothorax, the antennæ inserted just behind the middle, the second funicular joint nearly three-fourths as long as the first and fully as long as the next two combined; club small, oval, abrupt, densely pubescent, as long as the preceding four joints and with its basal joint nearly one-half of the whole.

Prothorax but slightly wider than long, tubulate at apex, the punctures small, deep, close, tending to coalesce longitudinally, the median polished line distinct. Elytral intervals wide and flat. Prosternum with an elongate-oval, excessively deep excavation, with its edges rounded, the coxæ separated by but slightly more than one-fourth of their own width, the large corneous process before each arising vertically for a short distance, then flexed abruptly and obliquely forward, becoming finely acuminate. Length 5.8 mm.; width 2.8 mm.

Missouri. Cab. LeConte. Represented by the unique type. The narrowly vittate elytra will readily serve to identify this distinct species.

3 **Centrinus striatirostris** Lec.—Proc. Am. Phil. Soc., XV, p. 309.

Robust, oval, convex, piceous and shining, the vestiture sparse, whitish, consisting of very elongate narrow scales and finer hair-like squamules indiscriminately mingled on the elytra, the finer squamules not noticeably darker in color; on the under surface they are broader and denser, and on the pronotum are also coarser toward apex and at base near the sides and in the middle, also in a large conspicuous spot at each side of the scutellum. The beak is rather stout and feebly arcuate, but slightly longer than the head and prothorax, deeply punctate and longitudinally rugose at the sides, the antennæ inserted just beyond the middle, the second funicular joint less than one-half as long as the first and about one-half longer than the third, the club rather large, oval, fully as long as the preceding five joints together, densely pubescent, the basal joint two-fifths of the whole. Prothorax strongly tubulate at apex, the disk with coarse rugose sculpture and a narrow impunctate line. Elytra a little wider than the prothorax and about twice as long, the striæ rather coarse, deep, the intervals flat, two to three times as wide as the grooves, coarsely and sparsely punctato-rugulose. Prosternum in the male with a large elongate-oval extremely deep excavation, extending to the coxæ, the latter separated by two-fifths of their own width in both sexes; in the female the prosternum is flat, with a small abrupt oval and extremely deep excavation near the anterior margin. Length 4.4–4.5 mm.; width 2.25–2.4 mm.

Texas. The ante-coxal corneous process of the male is erect, short, stout, acuminate and about as long as the antennal club in the specimen which I have under observation.

4 **Centrinus modestus** Boh.—Sch. Curc., III, p. 772.

A well-known species of robust, oval, strongly convex form and piceous color, sparsely sprinkled with coarse white scales and narrower brownish squamules above, and more densely covered with whitish scales beneath. The beak is about one-half as long as the body, evenly but not very strongly arcuate, moderately stout, slightly gibbous at base, so that it is separated from the head by an unusually deep and sharply marked transverse impression; antennæ normal, inserted a little beyond the middle, the scape short, extending about two-thirds the distance to the eyes, the second funicular joint scarcely more than one-half as long as the first. Prothorax strongly constricted and almost tubulate at apex. Prosternum with a deep oval abruptly glabrous subapical spot, which is very deeply and transversely excavated at the bottom, and continued posteriorly by a feebly defined canaliculate and squamose impression, which becomes narrower and gradually evanescent before the coxæ, the latter large and separated by scarcely more than one-fourth of their own width, with the middle of the anterior margin of the acetabula elevated in a feeble cusp-like prominence, or short corneous process in the male. Length 4.0–4.5 mm.; width 2.3–2.5 mm.

The four specimens in my cabinet are from Pennsylvania and Florida. In well preserved specimens a small spot of dense scales is evident at each side of the scutellum, and another just before each humeral callus, the former not being as large or conspicuous, however, as in *striatirostris*.

5 **Centrinus tortuosus** n. sp.—Rather robust, feebly rhomboid-oval, convex, shining, coarsely sculptured, piceous-black, the antennæ paler; vestiture very sparse above, consisting of large white scales and small narrow brown squamules indiscriminately mingled on the elytra, dense beneath, and with the scales white, short, broad and truncate. Head almost completely impunctate, the transverse constriction abrupt, almost in the form of a groove; beak rather stout, feebly arcuate, very coarsely, deeply, longitudinally punctate and rugulose at the sides, a little longer than the head and prothorax in the male, the antennæ inserted distinctly beyond the middle, the scape short, second funicular joint one-half as long as the first and nearly as long as the next two, club well developed, oval, abrupt, densely pubescent, about as long as the preceding five joints together and with its basal joint composing about one-half of the mass. Prothorax three-fifths wider than long, the sides distinctly convergent and almost straight from the base to apical third, then broadly rounded and convergent to the deep apical constriction, the apex strongly tubulate, truncate, not quite one-half as wide as the base, the latter transverse and perfectly straight, the median lobe less than one-third of the



total width, abrupt, prominent and rounded; disk with coarse oblique parallel wavy rugæ, and with a narrow subcarinate impunctate line in basal two-thirds. Scutellum glabrous, small, subquadrate, broadly emarginate at apex and deeply impressed along the middle. *Elytra* at the large and somewhat prominent humeri, conspicuously wider than the prothorax, distinctly more than twice as long as the latter, the sides rapidly convergent from base to apex and feebly arcuate, the apex narrowly rounded; disk with moderately coarse, deep, abrupt, finely and remotely punctured striæ, the intervals flat, three times as wide as the grooves, coarsely, not densely punctato-rugulose. Length 3.8 mm.; width 2.0 mm.

Texas.

The single specimen is a male and agrees nearly in prosternal structure with *modestus*, the surface being very broadly and feebly impressed, except just behind the apical margin, where there is a large and transversely oval, extremely deep excavation. The coxæ are much more widely separated than in *modestus*, the interval being equal to fully one-half of their own width, and the form of the body is more narrowly oval; it also differs greatly in pronotal sculpture, the latter being finer and in the form of long oblique rugæ. In the male the middle of the anterior margin of the anterior acetabula has a small feeble cusp-like elevation as in *modestus*.

## II.

6 **Centrinus picumnus** Herbst—Käfer, VII, p. 30 (Curculio); *olivaceus* Gyll.: Sch. Curc., III, p. 763; *sutor* Harris: Trans. Hart. Nat. Hist. Soc., I, p. 81 (Centrinus).

Somewhat broadly oval, convex, black throughout, densely and uniformly clothed above with long more or less narrow lineate squamules, pale ochreous-yellow to whitish in color, a little paler, denser and much wider beneath. Beak similar in the two sexes, a little longer in the female, very strongly arcuate, fully one-half as long as the body; antennæ inserted well behind the middle, the second funicular joint but slightly elongate, not one-half as long as the first and one-half longer than the third; club abrupt, moderate, oval, densely pubescent, nearly as long as the four preceding together and with its basal joint composing nearly one-half of the mass. Prothorax fully one-half wider than long, conical, with the sides feebly arcuate, feebly constricted near the apex, the squamules denser and broader on the small but prominent basal lobe. *Elytra* a little wider than the prothorax and nearly twice as long. Prosternum in the male narrowly, extremely deeply excavated along

the middle, with a long erect anteriorly bent horn before each coxa, the coxæ separated by scarcely more than one-third of their width; in the female with a small but extremely deep excavation near the anterior margin, bordered on each side by a longitudinal ridge, exterior to which there is also a deep excavation, devoid of corneous processes and with the coxæ separated by fully two-thirds of their own width. In the male there is a rounded very feebly impressed spot near the base of the abdomen, which is abruptly nearly glabrous, and in which the ordinary scales become semi-erect and each deeply split into two or three hair-like processes. Length 2.1–2.7 mm.; width 1.0–1.6 mm.

New York, Florida, Nebraska, Arkansas and Arizona. The sexual modifications in this small group of species are remarkable, especially in the divergence of prosternal impression, and in degree of separation of the anterior coxæ.

7 **Centrinus albotectus** n. sp.—Rather broadly oval, convex, black, densely and uniformly clothed with rather wide white scales, which are but slightly broader and denser beneath. *Head* and base of the beak squamose, the beak strongly, evenly arcuate and slender in both sexes, but scarcely longer than the head and prothorax in the male, and fully one-half as long as the body in the female; antennæ in the male with the basal joint of the funicle as long as the next three, the second small, but slightly longer than the third, three to five each a little longer than wide, the club small abrupt, short, oval, scarcely longer than the preceding three joints together; in the female the club is less abrupt, larger and more elongate, with the basal joint of the funicle barely longer than the next three. *Prothorax* fully one-half wider than long, the sides distinctly convergent from the base and broadly arcuate, rather strongly constricted behind the apex, the latter sometimes almost tubulate; base transverse and straight, the median lobe small but very prominent; disk uniformly and very densely punctate and squamose. *Scutellum* very small, almost concealed by the vestiture. *Elytra* hemi-elliptical, a little wider than the prothorax and twice as long in the male, but relatively distinctly shorter in the female; humeri moderately prominent; striæ rather fine, very deep, the intervals flat, three or four times as wide as the striæ, densely punctato-rugulose. *Prosternum* in the male with an elongate-oval, extremely deep excavation, the coxæ separated by one-half of their own width; in the female, with a small rounded very deep pit just behind the apical margin, also somewhat impressed laterally as in *picumnus*, and with the coxæ separated by two-thirds of their own width. Length 1.75–2.5 mm.; width 0.7–1.3 mm.

Florida, Texas (Columbus).

In the male there is a long very slender finely acuminate horn before each coxa, the process being inclined forward and very feebly

arcuate; in the same sex there is a small semi-glabrous flattened spot near the base of the abdomen, in which the ordinary scales become very sparse small and narrow, but recumbent and not modified in structure. This species may be readily distinguished from *picumnus* by its broader white scales, shorter beak with more pronounced sexual differences, by its smaller size and more slender form. Twelve specimens.

## III.

8 ***Centrinus neglectus*** Lec.—Proc. Am. Phil. Soc., XV, p. 310.

Similar in form and structural characters to *perscillus*, but clothed densely throughout with ochreous-yellow scales, broad beneath, narrow and slender above, where they are unevenly mixed with darker brown scales of the same kind, the brown scales forming also two distant subapical spots. Beak slender, very strongly arcuate, not quite one-half as long as the body in the female, the antennæ inserted a little behind the middle, the scape rather abruptly clavate, extending barely three-fourths of the distance to the eyes; second funicular joint slender but short, scarcely one-half as long as the first and a little longer than the third, the outer joints larger, the club as in *perscillus*. Prosternum flat, abruptly declivous anteriorly to the transverse constriction, the coxæ moderate, remote, separated by distinctly more than their own width. Length 3.6–4.0 mm.; width 1.7–1.8 mm.

Texas, Louisiana and Kansas. The specimens before me are females, but the male is said to have a short corneous process before each coxa. The statement in the original description that the second funicular joint is "nearly as long as the first," is a conspicuous error. This species is closely allied to *perscillus*.

9 ***Centrinus griseus*** n. sp.—Feebly rhomboideo-elliptical, convex, rather dull, black throughout, densely clothed throughout beneath with large wide yellowish-white scales, and, on the upper surface, with squamules which are narrower, and luteous-white and dark brown intermingled, the latter more evident in two distant spots near the apex as in *neglectus*. Beak strongly arcuate, relatively not longer and but slightly more slender in the female than in the male, but notably more arcuate in the former sex, not quite one-half as long as the body; antennæ inserted as in *neglectus*, the second funicular joint much more slender than the first and not quite one-half as long, much shorter than the next two together; club about as long as the preceding four joints combined, not very abrupt, densely pubescent, with the basal joint composing but slightly less than one-half of the mass. *Prothorax* one-third

wider than long, the sides feebly convergent and nearly straight in basal two-thirds, then broadly rounded and gradually convergent to the apex, which is truncate and one-half as wide as the base, the latter straight and transverse, with the median lobe small but abrupt and prominent, rounded; apical constriction broad and feeble; disk somewhat coarsely deeply and very densely punctate, with a narrow, more or less incomplete impunctate line. Scutellum moderate in size, quadrate. *Elytra* slightly wider than the prothorax and twice as long, the humeri rather prominent, the sides thence strongly convergent and very feebly arcuate to the narrowly rounded apex; striae fine but deep, the intervals flat, three or four times as wide as the striae, confusedly, rather coarsely punctato-rugulose. Prosternum broadly, distinctly impressed in the middle in both sexes, but much more deeply so in the male the latter having a short erect acuminate horn before each coxa; anterior coxae rather large, separated by barely their own width. Length 3.5–4.1 mm.; width 1.65–1.9 mm.

North Carolina (Asheville); Ohio; Illinois; Missouri.

Very closely allied to *neglectus*, but differing in its whitish and not dark yellow vestiture, by the broad distinct impression of the prosternum in both sexes, and quite distinctly less widely separated anterior coxae. Numerous specimens.

10 ***Centrinus perscillus*** Gyll.—Sch. Curc., III, p. 762.

Elliptical, moderately robust, the upper surface feebly flattened, black, densely clothed throughout above and beneath with grayish-white elongate scales. Beak slender, very strongly, evenly arcuate, one-half as long as the body, with a narrow smooth impunctate line; sides toward base densely punctate; antennae inserted a little behind the middle, the scape extending thence three-fourths of the distance to the eyes, second funicular joint slender but unusually short, not quite one-half as long as the first and but very slightly longer than the third; club moderate, oval, densely pubescent, a little longer than the preceding four joints together, and with the basal joint constituting somewhat less than one-half the mass. Prosternum flat, rather abruptly declivous anteriorly to the transverse constriction, separating the coxae by quite distinctly more than their own width. Length 3.7 mm.; width 1.85 mm.

The two specimens before me are apparently females, and are from Kansas and Minnesota. I think that this is without doubt the species described by Gyllenhal, and the species so identified by LeConte (Proc. Am. Phil. Soc., XV, p. 310), having the second funicular joint as long as the first and the prosternum deeply excavated, is probably some other species which remains unknown to me.



The species described by Gyllenhal is said to be covered densely with narrow scales, agreeing with the present form, but in *perscillus* Lec. the scales are especially noted as being "not linear but oval."

11 **Centrinus finitimus** n. sp.—Rhomboid-oval, convex, slightly shining, black, the tibiae feebly rufescent; vestiture yellowish, pale, consisting, on the upper surface, of long, slender but rather large squamules, which are rather dense and uniformly distributed, and, beneath, of larger and very dense scales. *Head* dull but smooth, minutely, sparsely punctate, the impression almost obsolete, with a small median fovea; beak long, polished, slender, evenly, rather strongly arcuate and fully one-half as long as the body, but very feebly thickened toward base, strongly flattened toward apex, where it is distinctly dilated, scarcely noticeably enlarged at the point of antennal insertion, rather coarsely, rugosely and densely punctate, the punctures forming series and grooves; antennæ inserted at the middle, black, somewhat slender, and with the basal joint of the funicle barely as long as the second, the latter as long as the next two combined. *Prothorax* about three-fifths wider than long, the sides broadly, evenly and strongly arcuate, becoming parallel toward base and broadly sinuate near the apex, the latter much less than one-half as wide as the base; disk coarsely, deeply, very densely punctate, the punctures tending to coalesce longitudinally; impunctate line narrow but almost entire. Scutellum small, quadrate, enlarged and broadly emarginate at apex, impressed along the middle, setose at the sides. *Elytra* but slightly wider and three-fourths longer than the prothorax, the sides strongly convergent, evenly, feebly arcuate, the apex narrowly, evenly rounded, not very coarsely but deeply striate, the intervals flat, moderate in width, rather sparsely, confusedly and rugulose punctured, polished. *Abdomen* broadly, rather strongly impressed and more sparsely squamose in the middle toward base. Prosternum with a very large and deep impression, and two rather short, erect and stout processes before the coxæ, the latter separated by fully three-fourths of their own width. Length 2.9–3.3 mm.; width 1.4–1.7 mm.

Texas (Dallas)—Mr. Wickham; Missouri.

This species differs from *perscillus* in its smaller size, broader form, more transverse prothorax, structure and vestiture of the scutellum, and generally silaceous squamules of the upper surface. Seven specimens.

12 **Centrinus hospes** n. sp.—Rhomboidal, convex, black, the antennæ piceous, the club pale; vestiture white, consisting of long, slender, rather dense and uniformly distributed squamules on the upper surface, and large, broad, very dense scales beneath. *Head* finely, strongly, somewhat sparsely punctate, with a few squamules toward the eyes, the transverse impression distinct and somewhat angular; beak in the female one-half as long as the body, evenly, rather strongly arcuate, the portion beyond the antennæ very slender, smooth, nude and almost completely impunctate, the portion behind

the antennæ abruptly very strongly inflated, thick, densely punctured and squamose, with a smooth median line; antennæ inserted at basal third, the scape very short, but slightly longer than the basal joint of the funicle, the latter nearly as long as the next three, the second slightly longer than the third, both elongate, joints three to six longer than wide, club oval, abrupt, densely pubescent, almost equally trilobed by the distinct sutures and one-half as long as funicular joints two to seven. *Prothorax* rather short, three-fourths wider than long, the sides broadly, strongly arcuate anteriorly, becoming nearly parallel in basal half and rather strongly sinuate behind the apex, which is truncate and one-half as wide as the base, the latter transverse, the median lobe prominent and equalling one-third of the total width; disk somewhat coarsely, deeply and very densely punctured, without distinct impunctate line, the vestiture covering the entire surface. Scutellum densely squamose. *Elytra* quite distinctly wider than the prothorax and a little more than twice as long; sides strongly convergent and feebly arcuate throughout, the apex narrowly rounded; humeral callus strong and prominent; mesepimera not visible from above; striæ rather fine, deep, the intervals wide, rather coarsely, deeply, confusedly, very densely and rugosely punctured. *Abdomen* strongly convex toward base, strongly inclined upward toward apex. Prosternum nearly flat, very densely squamose, the coxæ separated by three-fourths of their own width. Length 3.5 mm.; width 1.7 mm.

Arizona (Tucson). Mr. Wickham.

I have only seen the female, and the remarkable form of the beak, reminding us strongly of *Eunyssobia* (*Euchætes* Lec.), is probably peculiar to that sex, as it may be observed to a less degree in several other species of this subgenus, and notably *griseescens*; at any rate, the peculiar basal enlargement is much more developed in the female than in the male of that species.

13 ***Centrinus clarescens*** n. sp.—Rather narrowly ovoidal, convex, pale rufo-testaceous throughout, the scutellum, head and beak rather darker and piceous; vestiture consisting of rather large, moderately elongate, ochreous-yellow scales, rather dense and uniformly distributed above, very dense and broader beneath. *Head* alutaceous, completely glabrous, exceedingly minutely and sparsely punctate; impression completely obsolete, with an elongate median fovea; beak in the male slender, strongly, evenly arcuate, gradually and but slightly thicker toward base, distinctly punctured and sparsely squamose at the sides behind the antennæ, shining, polished and almost impunctate elsewhere, dilated at apex and at the point of antennal insertion, and very nearly one-half as long as the body; antennæ slender, inserted just behind the middle, the first two joints of the funicle equal in length, the second much the more slender and fully as long as the next two, seventh slightly longer than wide and a little thicker than the preceding, club oval, abrupt, but slightly longer than the three preceding joints combined. *Prothorax* about one-half wider than long, the sides broadly, evenly

arcuate, becoming parallel behind the middle and broadly sinuate near the apex, which is truncate and quite distinctly less than one-half as wide as the base, the latter transverse, the lobe less than one-third the width, rounded and rather prominent; mes-epimera strongly exposed from above in the basal reëntrant angle; disk somewhat coarsely, very densely, rather rugosely punctured, the impunctate line only narrowly and indefinitely traceable toward the middle. Scutellum small, quadrate, glabrous, impressed along the middle. *Elytra* slightly wider than the prothorax and twice as long, the sides strongly convergent, feebly and evenly arcuate throughout, the apex narrowly, evenly rounded, the humeral callus not distinctly prominent; disk deeply, not very coarsely striate, the intervals from two to three times as wide as the grooves, densely, confusedly and rugosely punctured. *Abdomen* broadly, feebly impressed and more sparsely squamose in the middle toward base. Prosternum with a large, moderately deep impression, subglabrous at the bottom, and with a short stout erect process before each coxa, the coxæ rather large and separated by four-fifths of their own width. Length 2.9 mm.; width 1.35 mm.

District of Columbia.

The typical representative above described is a male. The species is altogether distinct from any other here noted, and may be known at once by the pale coloration of the integuments and the ochreous scales.

14 **Centrinus perscitus** Herbst—Käfer, VII, p. 28 (Curculio).

Oval, convex, piceous-brown, the elytra rufous; vestiture not very dense, ochreous-yellow, consisting of closer and broader scales beneath, and on the upper surface of narrow squamules which are abruptly much denser along the sides of the pronotum, the elytra also with a few larger whiter and very widely dispersed scales. Beak rather short and thick, evenly, strongly arcuate, as long as the head and prothorax in the female, similar but a little shorter and thicker in the male, the antennæ rather short, inserted at or just behind the middle, the first funicular joint robust, fully as long as the next three, second not twice as long as wide; club rather large, oval, as long as the five preceding joints combined, densely pubescent and indistinctly annulated. Prothorax fully two-thirds wider than long, the sides feebly convergent and very slightly arcuate to apical third, then broadly rounded convergent and broadly sinuate to the apex; disk very densely, not coarsely punctate. Elytra conoidal, narrowly rounded at apex, a little wider than the prothorax and sensibly more than twice as long, the striæ fine but deep, the intervals densely, confusedly punctato-rugulose, flat, three to four times as wide as the grooves. Prosternum in the male narrowly,

deeply excavated and having a very stout acuminate erect process before each coxa; in the female flat, without trace of impression; anterior coxæ separated by three-fourths of their own width. Length 2.5–2.7 mm.; width 1.3 mm.

The two specimens before me are from New Jersey and Indiana. It is somewhat singular that Dr. LeConte should have failed to see the corneous prosternal processes in the male of this species; they are quite conspicuous and must have been concealed by the anterior femora in the specimens which he examined.

15 **Centrinus exulans** n. sp.—Rather broadly rhomboid-oval, convex, piceo-rufous throughout and densely clothed with scales, which are narrower and yellowish in the middle three-fifths of the pronotum, whiter and denser at the sides and also on the elytra near and especially behind the scutellum. *Head* rather coarsely, densely punctate, dull and squamulose, the impression almost completely obsolete; beak somewhat stout, short, evenly cylindrical, smooth toward apex but densely punctate, rugose and squamose toward base, evenly, rather strongly arcuate and not quite as long as the head and prothorax; antennæ inserted distinctly behind the middle, the scape as long as the next four joints, first funicular joint fully as long as the next three, second about equal to the succeeding two, club moderate, ovo-conoidal. *Prothorax* short and transverse, four-fifths wider than long, the sides evenly, strongly arcuate and convergent from base to apex, becoming parallel near the former and feebly sinuate near the apex, which is transversely truncate and distinctly less than one-half as wide as the base, the latter straight and transverse, the median lobe one-third of the total width, rounded and prominent; disk not very coarsely, deeply, densely punctate, the impunctate line feebly traceable and extremely fine. Scutellum moderate, squamose, slightly transverse. *Elytra* slightly wider than the prothorax and fully twice as long, the outline almost evenly ogival from base to apex, the latter acutely rounded; humeral callus quite distinctly prominent; disk rather finely, deeply striate, the intervals wide, flat, densely and confusedly punctate. *Abdomen* very densely punctured and squamose throughout. Prosternum nearly flat, separating the coxæ by appreciably less than their own width. Length 3.3 mm.; width 1.6 mm.

New Mexico (Gallup). Mr. Wickham.

The single specimen is a female, but the species is very distinct and allied only to *perscitus*. It differs from *perscitus* in its much larger size and stouter form, in the decidedly shorter relative length of the intermediate and posterior tibiæ, and in the pronotal punctures which are here very close but circular in outline and not in actual contact, while in *perscitus* they are coarser and polygonally crowded. These two species belong to a peculiar type, distinguished from the other allies of *perscillus* by the very much shorter, stouter and evenly cylindrical beak.



## IV.

16 **Centrinus senilis** Gyll.—Sch. Curc., III, p. 759; Boh., l. c., VIII, p. 215.

Narrowly rhomboid-oval, convex, black, the tibiæ and antennæ rufo-piceous; vestiture white, consisting of long, very slender, not very densely but uniformly distributed squamules on the upper surface, which are replaced, however, by black squamules in two broad transverse elytral bands, interrupted at the suture, one at the middle and the other near the apex; on the under surface the scales are elongate, but broader and denser. Head alutaceous, finely but strongly, sparsely punctured, glabrous, with the exception of a line of very minute squamules along the edge of the eyes; impression very broad and almost obsolete, with a small feeble median fovea; beak abruptly polished, slender, feebly but almost evenly arcuate, gradually slightly thicker and more arcuate at the base, sparsely punctured and squamulose at the sides near the base but elsewhere very minutely, sparsely punctate and glabrous, not at all dilated at the antennæ but gradually wider and flatter toward apex, about two-thirds as long as the body; antennæ inserted just beyond basal third, slender, the scape extending almost to the eye, the first funicular joint slender, clavate, as long as the next two, second slender and as long as the third and fourth, outer joints slightly thicker and nearly as wide as long, club rather small and narrow, oval, pointed. Prothorax barely one-third wider than long, the sides evenly, broadly arcuate, convergent anteriorly, becoming broadly sinuate behind the apex and almost parallel near the base, the latter transverse, the lobe less than one-third the width but strongly rounded and very prominent; apex truncate and distinctly more than one-half as wide as the base; disk dull, not very coarsely, extremely closely and polygonally punctate, the impunctate line not distinct. Scutellum well developed, quadrate, slightly wider and transverse behind, the angles acute; surface flat, moderately densely squamulose. Elytra distinctly wider and three-fourths longer than the prothorax, the sides very strongly convergent, broadly, feebly arcuate, the apex narrowly rounded; humeral callus very prominent; disk rather finely striate, the intervals wide, somewhat dull, finely, rather sparsely, confusedly and slightly rugosely punctate throughout. Prosternum flat and separating the coxæ by fully three-fourths of their own width, but strongly constricted laterally behind the apex, and with a trans-

versely oval, deep, polished and glabrous subapical pit, separated from the lateral constriction by obtuse elevations. Length 3.5 mm.; width 1.65 mm.

Arizona (Santa Rita Mts.). Mr. Wickham. The single representative before me is a female; I have not seen the male. The remarkable form of the mandibles and the robust excavated tarsal claws, may ultimately necessitate the generic separation of this species, for which Mr. Pascoe has already suggested a name.

The spots of the elytra appear to be denuded, but, as in all similar cases in this genus, these areas are not really denuded but quite as densely clothed with blackish and sometimes more slender squamules.

## V.

17 **Centrinus acuminatus** n. sp.—Narrowly rhomboidal, black, the antennæ rufo-piceous with the club paler and brown; lustre dull, the sculpture dense but not very deep; vestiture pure white, consisting of broad, extremely dense scales beneath and of longer, sparser, evenly distributed squamules above, not entirely concealing the surface; those of the pronotum directed transversely, those of the elytral intervals not arranged in lines. *Head* finely, sparsely punctate, with a squamose area above each eye, the transverse impression well marked; beak in the male distinctly robust toward base, strongly tapering thence to the apex and scarcely longer than the head and prothorax, in the female distinctly longer and much more slender, strongly arcuate, densely, deeply sculptured, squamose, the antennæ inserted just behind the middle, the scape moderate, rather abruptly clavate, the funicle very long, slender, bristling with an irregular fringe of long flexible white setæ along its internal side, the second joint very slender, scarcely more than one-half as long as the first and barely one-half longer than the third, two to four decreasing in length, outer joints not at all transverse, the club aberrant, slender, more than twice as long as wide, about as long as the preceding four joints combined, abrupt, densely pubescent, with the annulations very distinct, almost articulate, and with the two basal joints together occupying scarcely more than one-half of the length. *Prothorax* one-half wider than long, the sides broadly, feebly arcuate, gradually convergent and sinuate anteriorly, becoming nearly parallel toward base; apex distinctly less than one-half as wide as the base, the latter transverse, with the median lobe small but distinct; disk rather coarsely but not very deeply punctate, without median line, the punctures extremely densely, polygonally crowded, forming almost even hexagons at some points. *Scutellum* moderate, very densely squamose, subquadrate. *Elytra* about one third longer than wide, nearly twice as long as the prothorax, and at base, rather abruptly, distinctly wider than the latter, the humeri small but prominent, the sides rapidly convergent thence to the apex and feebly arcuate, the apex very narrowly rounded; disk deeply but not coarsely striate, the intervals three or four times as wide as

the grooves, broadly convex, coarsely densely and deeply punctato-rugulose. Prosternum very obsoletely impressed along the middle, separating the coxæ by a little more than one-third of their own width and rather narrowly emarginate behind. Length 3.2–3.8 mm.; width 1.6–1.75 mm.

Texas; Arizona (Tuçson).

In form and size this very distinct species is nearly similar to *penicellus*, but the beak is shorter and the antennæ of singular structure. The male differs from the female in having the anterior trochanters obtusely toothed. The hind tibiæ are bent outward slightly and feebly dilated at apex, the internal spur not visible and the apical margin transversely truncate, a peculiarity of structure which is very highly developed in *Eisonyx*. Three specimens.

18 **Centrinus globifer** n. sp.—Form, color, sculpture and vestiture throughout almost exactly as in *acuminatus*, the lustre a little more shining and the rugose punctures of the elytral intervals not quite so dense. *Beak* in the male thick toward base, arcuate, not quite as long as the head and prothorax, the scape short, gradually clavate, inserted at basal two-fifths, the funicle robust, cylindrical, bristling with long flexible setæ, especially along the anterior or internal side, the second joint but slightly more than twice as long as wide, three-fifths as long as the first and distinctly longer than the third, two to four decreasing in length, five to seven subquadrate, moniliform, the seventh a little wider than long, the club extremely abrupt, robust, elliptical, as long as the preceding four joints together, scarcely one-half longer than wide, the sutures fine but deep, the basal joint narrower and shorter than the second, the first two together composing only one-half of the mass, the surface throughout polished and very sparsely pubescent, the first in great part, and the second near the base, completely glabrous. The prosternum is flat, with two deep approximate denuded subapical foveæ, and separates the coxæ by one-half of their own width. Length 3.7 mm.; width 1.8 mm.

Texas (El Paso).

The extreme resemblance which this species bears to *acuminatus* in every external feature is very remarkable, in view of the equally striking difference in antennal structure, and in the more widely separated anterior coxæ. The single male before me has the anterior trochanters obtusely dentate, the tooth lamelliform. The posterior tibiæ are nearly as in *acuminatus*, although a little shorter, the posterior femora are also a little shorter thicker and with more arcuate external outline.

## VI.

19 **Centrinus penicellus** Herbst—Käfer, VII, p. 29 (Curculio); *holosericeus* Gyll.: Sch. Cure., III, p. 760 (Centrinus); *pubescens* Uhler: Proc. Acad. Nat. Sci., Phila., VII, p. 417 (Baridius).

This species is so well known, and so easily recognizable by the characters given in the table, that but little further need be said of it. The antennæ are slender, rather long, the second funicular joint very slender, fully two-thirds as long as the first and scarcely as long as the next two together, the latter equal and each distinctly elongate, the club small, rather abrupt, elongate-oval, pointed and but slightly longer than the three preceding joints combined, densely pubescent and with its basal joint constituting scarcely two-fifths of the mass; the scape is slender, rather abruptly clavate and inserted just beyond basal third. The prosternum is flat, extremely densely squamose, feebly bitumorse at the apex, and with a transverse excavated groove at a sensible distance behind the apical margin, the coxæ rather large, somewhat prominent and separated by barely two-thirds of their own width. Anterior trochanters small and simple in both sexes. Length 3.5–3.8 mm.; width 1.7–1.9 mm.

The series before me is from Iowa and Indiana. I have seen no specimen in which the apical subsutural denuded spots were completely wanting, but the others are frequently obliterated. It is probable that the Cuban *tomentosus* Klug, i. litt., is a different species from this.

## VII.

20 **Centrinus lineellus** Lec.—Proc. Ac. Nat. Sci., Phila., 1859, p. 79.

A finely ornamented small species of rather robust, oval, convex form, black throughout, the antennal scape rufous; under surface clothed densely with large yellowish-white scales, the same forming three distinctly limited broad vittæ on the pronotum, and covering the second elytral interval throughout, the third in apical two-thirds, the fourth in basal fourth, the sixth more or less throughout, and the seventh and eighth except toward the humeri; remainder of the upper surface clothed with large piceous-black scales. Beak in the female slender, evenly and extremely arcuate, a little more than one-half as long as the body, the antennæ inserted just behind the middle, the scape short, extending thence only two-thirds the distance to the eyes, the second funicular joint slender, a little more than one-half as long as the first and distinctly shorter than the next two, the latter subequal and each a little longer than wide, outer joints gradually and distinctly transverse, the club small, narrowly oval, not very abrupt, densely pubescent, as long as the preceding four joints combined, and with the basal joint composing



nearly one-half the mass. Prosternum flat, with a small denuded but unimpressed spot behind the apex, the apical margin with a close series of long broad porrect scales, extending over the basal parts of the head, the anterior coxæ rather small, separated by fully three-fourths of their own width. Posterior tibiæ normal, slender, finely, acutely dentate externally at apex, with the internal spur distinct. Length 2.8 mm.; width 1.4 mm.

California—Cab. LeConte. Represented by the unique female type.

### VIII.

21 **Centrinus capillatus** Lec.—Proc. Am. Phil. Soc., XV, p. 311.

Rather narrowly rhomboid-oval, convex, shining, black, the legs and antennæ paler, rather sparsely clothed above with long slender white hair-like squamules, which are uniform in size and distribution on the elytra, except a little wider just behind the scutellum, very sparse and slender on the pronotum, becoming a little broader toward base in the middle and at lateral fourth, broad and rather dense on the under surface. Beak in the male slender, strongly arcuate, nearly one-half as long as the body, the antennæ inserted well behind the middle, the first funicular joint about as long as the next three, the second more slender, rather more than one-half as long as the first and about equal to the next two, the club small, robust, abrupt, but slightly longer than wide, pale, densely pubescent, with the basal joint constituting distinctly less than one-half the mass. Prothorax rather short, truncate, conical, the sides broadly rounded, the constriction feeble; disk rather coarsely but not very deeply, moderately closely punctate, with a distinct impunctate line. Elytra a little longer than wide, slightly wider than the prothorax and not quite twice as long, conical, narrowly rounded at apex; disk with deep striæ, the intervals nearly three times as wide as the grooves, confusedly but not very densely punctato-rugulose. Prosternum flat, not impressed and without trace of apical constriction, but with a small denuded spot at some distance behind the apex, from which the scales radiate in all directions; coxæ separated by one-half their own width. Length 2.75–3.0 mm.; width 1.3–1.5 mm.

Texas. In the female the beak is more abruptly bent near the base. The prosternum in both sexes is perfectly simple before the coxæ, and without trace of the "slender cusp" mentioned by LeConte.

22 **Centrinus nubecula** n. sp.—Oval, rather robust, moderately convex, black and shining throughout, the anterior tibiæ rufous and longer than the others; vestiture white, rather sparse, consisting on the upper surface of very slender hair-like squamules, disposed in nearly even approximate lines on the elytra, and becoming coarse and denser scales about the scutellum and in a subsutural area on each just behind the middle; on the pronotum they are coarser and denser near the base before the scutellum and at lateral fourth; on the under surface they become moderately wide and close, except on the apical half of the prosternum, where they are very fine and sparse but radiating from the peculiar antero-central point mentioned in the other species of this subgenus. *Head* prominently convex, finely, sparsely punctate, the beak strongly arcuate in basal third, thence feebly arcuate and very thin viewed laterally, but broad and flattened viewed anteriorly to the apex, punctured at the sides toward base, nearly one-half as long as the body, the antennæ inserted well behind the middle, nearly as in *capillatus*, the first funicular joint as long as the next three, the second a little more than one-half as long as the first and about as long as the next two. *Prothorax* two-thirds wider than long, the apex truncate, not quite one-half as wide as the base; sides evenly, feebly arcuate and convergent from the base, the constriction broad and feeble; base transverse and straight, the median lobe small but prominent; disk rather coarsely, strongly, evenly and closely punctate, without evident impunctate line. Scutellum small, quadrate, impressed lunately behind. *Elytra* a little wider than the prothorax and not quite twice as long, evenly conoideo-elliptical in outline, the humeri basal, moderately prominent; disk not coarsely but very deeply, abruptly striate, the intervals flat, fully three times as wide as the grooves, rather finely but strongly, not densely and subtransversely punctato-rugulose. Prosternum feebly, transversely and indefinitely impressed anteriorly, separating the coxæ by one-half of their own width, without trace of corneous processes. Posterior tibiæ slender, strongly sinuate externally at apical fourth. Length 3.2 mm.; width 1.65 mm.

Texas.

From analogy in the case of *capillatus*, if we regard as the female the form having the beak more abruptly bent near the base and more widely flattened, the unique type of *nubecula* is of that sex, for the beak is even more noticeably flattened than in the species referred to. In the male, the beak is but slightly shorter, and is much more evenly and, on the whole, more strongly arcuate than in the female, and is cylindrical, although feebly flattened very near the apex. For the reasons stated, the male beak appears thicker from a lateral point of view than that of the female, but from an anterior point it is a little thinner.

23 **Centrinus clientulus** n. sp.—Rather narrowly rhomboid-oval, convex, polished, black throughout, except the legs which are bright rufous;

vestiture consisting of yellowish-white scales, broad and dense beneath, but sparse and generally slender toward the sides of the prothorax; on the upper surface they are rather broadly oval on the elytra behind the middle and near the scutellum, but elsewhere slightly narrower; on the pronotum narrow toward the sides and before the scutellum, but elsewhere very sparse, finer and hairlike. *Head* dull, very minutely, sparsely punctured, the beak in the female about one-half as long as the body, strongly and abruptly arcuate at the base, perceptibly flattened toward apex, deeply punctate at the sides toward base, the antennæ inserted well behind the middle, the basal joint of the funicle elongate, nearly as long as the next four together, second rather slender, not one-half as long as the first, not quite as long as the next two, the club small and especially very short, not more than one-third longer than wide and but slightly longer than the preceding three joints together, very abrupt, densely pubescent, with the basal joint constituting not quite one-half the mass. *Prothorax* rather short, two-thirds wider than long, the sides convergent and broadly arcuate from the base to the distinctly constricted apex, the latter almost tubulate and fully one-half as wide as the base, the latter straight and transverse, the median lobe small and prominent; disk rather coarsely punctate, the punctures shallow, close but not contiguous, with a narrow, more or less distinctly defined impunctate line. *Scutellum* truncate, not as long as wide. *Elytra* a little more than twice as long as the prothorax, and, at the small, rather prominent humeri, perceptibly wider than the latter; sides thence strongly convergent to the narrowly rounded apex and feebly arcuate; disk rather finely but deeply striate, the intervals between two and three times as wide as the grooves, flat, not very coarsely, moderately closely, strongly punctate rugulose. *Prosternum* broadly, scarcely visibly impressed, the anterior coxæ separated by about one-half of their own width. Length 2.6–3.0 mm.; width 1.2–1.5 mm.

Texas (Columbus). Mr. Schwarz.

This species is allied to *capillatus*, but differs in the much broader and more uneven scales of the elytra, and in its very pale bright rufous legs.

## IX.

24 **Centrinus falsus** Lec.—Proc. Am. Phil. Soc., XV, p. 315.

Oval, convex, black, the legs more or less rufo-piceous, moderately shining; vestiture whitish, consisting of very slender lineate squamules, sparse on the pronotum, closer and a little broader on the elytra, where they tend to aggregate in a broad line along the middle of the intervals; beneath they are denser wider and squamiform. Beak rather robust, moderately arcuate, a little longer than the head and prothorax, the antennæ inserted distinctly beyond the middle, the second funicular joint cylindrical, about one-half as long as the first and as long as the next two, the club well developed,

robust, oval, abrupt, nearly as long as the five preceding joints together, densely pubescent and with the basal joint constituting about two-fifths of the mass. Prothorax much wider than long, with the sides almost parallel and feebly arcuate in basal two-thirds, then strongly rounded, the apical constriction extremely feeble, the punctures fine and very dense, tending to longitudinal coalescence; median impunctate line distinct. Scutellum very densely squamose. Elytra a little wider than the prothorax and more than twice as long, rather less strongly narrowed to the apex than usual, the striæ somewhat fine but deep. Prosternum with a transverse subapical constriction, and a rather narrow moderately deep parallel sulcus along the middle, the sides of the sulcus somewhat abruptly defined; anterior coxæ separated by scarcely more than one-fourth of their own width. Length 3.6–4.0 mm.; width 1.6–1.8 mm.

Alabama and Iowa. In some respects this species forms a satisfactory passage from the species with armed male prosternum, to those of the *scutellum-album* group. I have been unable to note any prominent secondary sexual modification of the male.

## X.

25 ***Centrinus scutellum-album*** Say—Curc., p. 21, Ed. Lec., I, p. 287 (*Baridius scut.* Germ.: Sch. Curc., III, p. 730).

Subrhomboidal, convex, rather robust, the vestiture consisting of small, more or less narrow sparse white scales, which become large broad and dense on the under surface. Beak nearly straight, a little more than one-half as long as the body, abruptly and strongly bent at base, the flanks flattened and deeply longitudinally punctat rugulose throughout, more strongly arcuate along the under outline behind the antennæ, the latter inserted near apical third in the male, the basal joint of the funicle moderate in length, the second rather long, fully three-fourths as long as the first and subequal to the next three, joints three to seven small; club large, elongate, oval, densely pubescent, fully two-thirds as long as the funicle, the sutures feeble, arcuate on the inner side, the basal joint constituting a little more than one-third of the whole, nearly as long as wide, with a large tumid glabrous and polished area on the inner side, at the middle of which there is an erect acute spiniform process. Prothorax wider than long, scarcely at all constricted, the punctures rather coarse, deep, rounded, almost in mutual contact. Elytra distinctly



wider and about three-fourths longer than the prothorax, coarsely, deeply striate, the intervals very coarsely, confusedly punctate. Prosternum scarcely impressed, but with a large transverse abrupt and very deep excavation just behind the apex, the coxæ separated by scarcely one-third of their own width. Length 3.2–4.5 mm.; width 1.7–2.3 mm.

The description above given is taken from the male and in this sex the pygidium is considerably exposed between the elytral apices, and very oblique; in the female it appears to be somewhat less exposed. The body is more broadly rhomboidal than in the *salebrosus* group, and the sexual differences in the structure of the beak are not at all evident. The male is black, but the female is almost invariably more or less rufescent and has the prothorax shorter, the pronotal punctures larger and sparser, and the antennal club simple.

This species is represented in my cabinet from New York, Indiana, Missouri and Florida; it also occurs in Brazil.

26 **Centrinus denticornis** n. sp.—Robust, oblong-subrhomboidal, convex, moderately shining, black throughout, the vestiture of the pronotum consisting of very small sparse and slender squamules, evenly distributed but denser toward the sides behind the apical margin, also along the base near the sides and on the median lobe; on the elytra the scales are generally small, moderately wide, evenly and sparsely distributed over the intervals, each lying entirely within a very deep rounded puncture; scales of the under surface large, broad and very dense, the color whitish throughout. *Head* dull and alutaceous, finely but strongly punctured, the transverse impression feeble, the beak abruptly highly polished, in the male rather stout, flattened toward apex, as long as the head and prothorax, deeply, coarsely punctatopunctate at the sides, the median impunctate line entire, the antennæ inserted near apical third, the scape bent and clavate toward apex, the second funicular joint twice as long as wide, three-fourths as long as the first and one-half longer than the third, the club rather large, oval, densely pubescent, as long as the five preceding joints combined, the sutures fine but straight and distinct, the basal joint one-third of the whole, much wider than long, with a large glabrous polished area on the inner side, not extending beyond apical fourth of its length, which is more or less obtusely dentate. *Prothorax* large convex, the sides broadly rounded, strongly convergent anteriorly, becoming almost parallel in basal half, not constricted near the apex, the latter scarcely two-fifths as wide as the base, which is transverse and straight, with the lobe abrupt, prominent, and the basal angles obtusely rounded; disk with an evanescent partial impunctate line, the punctures not very large but deep, circular, almost in mutual contact but not polygonal. Scutellum subtransverse, densely squamose. *Elytra* distinctly wider than the prothorax but not much more than two-thirds longer than the latter, the humeri large, promi-

ment; sides strongly convergent, the apex rather narrowly rounded in the male, more broadly in the female, the striae very abrupt, deep, punctate, not very coarse, the intervals flat, two to three times as wide as the grooves, moderately coarsely, evenly, confusedly and very deeply punctured throughout. Prosternum in the male broadly, distinctly impressed along the middle, with a small transversely impressed fovea behind the apex, the coxae separated by scarcely two-fifths of their own width, almost similar in the female. Length 5.3–6.0 mm.; width 2.8–3.2 mm.

North Carolina; Kansas.

The beak in the male is feebly arcuate and much more strongly so toward base; in the female it is scarcely at all longer but more slender, cylindrical, smooth and minutely, sparsely punctured, except just before the eyes, where the punctures become coarse and close, but not rugose, the antennae inserted just beyond the middle; in the female the antennae are more slender and with a smaller simple club. This is probably our largest centrinide.

27 **Centrinus salebrosus** n. sp.—Oblong-oval, the upper surface moderately convex, black and dull, the legs and antennae more or less piceous; vestiture whitish, consisting of large broad and very dense scales beneath, finer but extremely variable on the upper surface. *Head* rather strongly and closely punctured, the transverse impression almost obsolete, with a small deep median fovea, the beak in the male moderate in length and thickness, as long as the head and prothorax, distinctly, evenly arcuate but more abruptly bent at base, flattened toward apex and slightly compressed at the sides, densely punctato-rugulose and deeply furrowed on the flanks, the antennae inserted at apical two-fifths, rather slender, the club rather small, oval, gradually pointed, densely pubescent, the basal joint composing rather more than one-third of the mass, with a small smooth glabrous area on the inner side toward base, at the centre of which there is a more or less distinct dentiform process. *Prothorax* about two-fifths wider than long; sides broadly arcuate, convergent anteriorly, becoming almost parallel in basal two-thirds, the constriction obsolete; apex very nearly one-half as wide as the base, the latter straight and transverse, the median lobe abrupt and densely, coarsely squamose; disk devoid of impunctate line, the punctures not very small, deep and rather dense throughout. *Scutellum* densely squamose. *Elytra* distinctly wider, and from three-fourths to four-fifths longer than the prothorax, the humeri rather large and abruptly, obtusely prominent; sides behind them unusually feebly convergent, the apex not narrowly rounded; disk with deep, abrupt, not very coarse grooves, the intervals two to three times as wide as the grooves, densely, confusedly punctate, the punctures coarse but indistinct and polygonally distorted. *Prosternum* not distinctly impressed, separating the coxae by barely one-half of their own width, and with a deep transverse groove behind the apical margin. Length 2.9–4.7 mm.; width 1.3–2.2 mm.

New York; Indiana; Kentucky; Dakota; Colorado; Texas.

The description is drawn from the male; in the female the beak is quite distinctly longer and rather more slender, evenly, somewhat strongly arcuate throughout, cylindrical, smooth, shining and minutely, sparsely punctate except at base, the antennæ inserted distinctly beyond the middle, and with the club unmodified.

This species is the most protean in its variations of any baride which I have seen; more especially in the vestiture of the upper surface, which may consist of very slender sparse squamules, or robust oval dense and very conspicuous scales, with every intergrade between these limits. The series before me consists of nearly sixty specimens.

28 **Centrinus pinguescens** n. sp.—Oblong-oval, stout, moderately convex, dull black, the antennæ and the tibiæ at least toward apex, rufescent; vestiture on the upper surface consisting of yellowish scales, elongate-oval and dense on the elytral intervals, minute, slender and inconspicuous on the pronotum, but larger and denser at base near the sides and toward the middle and also in the subapical constriction, large, yellowish-white and very dense beneath. *Head* somewhat finely, deeply, rather densely and conspicuously punctured, the impression broad and very feeble, with an elongate median fovea; beak in the male rather stout, deeply, coarsely and rugosely punctate, nearly evenly, distinctly arcuate and somewhat abruptly very strongly so near the base, a little longer than the head and prothorax; antennæ inserted well beyond the middle, the basal joint of the funicle rather short, stout, the second fully three-fourths as long as the first and equal to the next two together, sixth and seventh internally prominent, club very robust and abrupt, as long as the five preceding joints combined, extremely densely clothed with short recumbent setiform squamules, the basal joint constituting one-third of the mass, with a glabrous internal area, not extending much beyond the middle, at the centre of which there is a very minute but acute and prominent spicule. *Prothorax* two-thirds wider than long, the sides broadly, evenly rounded in apical half, becoming parallel and straight thence to the base, the subapical constriction feeble but distinct; apex distinctly less than one-half as wide as the base; disk very finely, extremely densely punctured and dull, with barely a trace of a very narrow partial impunctate line. Scutellum very densely and conspicuously squamose. *Elytra* slightly wider and two-thirds longer than the prothorax, but slightly longer than wide, the sides strongly convergent; apex rather abruptly, obtusely but not very broadly rounded; striæ rather coarse, deep, with the setæ minute; intervals flat, more than twice as wide as the grooves, coarsely, deeply, very densely and rugosely punctured throughout. *Abdomen* with the scales slightly smaller and sparser in the middle toward base in the male. Prosternum with a transverse subapical excavation, the coxæ separated by nearly one-half of their own width. Length 4.1 mm.; width 2.0 mm.

Arkansas (Little Rock). Mr. Wickham.

This species belongs near *salebrosus*, but differs in its more obese form, finer and still denser pronotal punctuation, shorter second joint of the funicle and very much more robust club. A single male.

29 **Centrinus pulverulentus** n. sp.—Oval, subrhomboidal, convex, black, the antennal funicle gradually rufous toward apex, the club black; vestiture white, that of the upper surface consisting of small evenly and sparsely placed truncate scales on the pronotum, generally larger and closer along the apical margin; on the elytra the scales are larger, rather sparsely but evenly distributed, elongate-oval and each lying completely within a large oval puncture, the squamules borne by the punctures at the bottom of the striæ rather broad, scale-like and distinct; scales of the under surface large, nearly as wide as long and extremely dense. *Head* finely, deeply, not very sparsely punctate, the usual small frontal fovea distinct; beak rather slender, almost straight but abruptly and strongly arcuate at base, nearly as long as the elytra in the female, and smooth polished, very minutely, sparsely punctate, but rather abruptly, coarsely and closely so at the sides near the base, the antennæ inserted at or just beyond the middle, the first funicular joint not as long as the next three, the second about two-thirds as long as the first and not quite as long as the next two, club well developed, robust, densely pubescent, with the basal joint not longer than the second and constituting less than one-third of the mass. *Prothorax* one-half wider than long, the sides convergent and broadly, nearly evenly arcuate from base to apex, the constriction extremely feeble; base, basal lobe and scutellum as in *salebrosus*; disk with an ill-defined fusiform impunctate spot in the middle, the punctures rather large, deep, dense but scarcely polygonal. *Elytra* distinctly wider than the prothorax and about twice as long, the sides strongly convergent, the apex rather abruptly rounded and about one-half as wide as the basal regions, the humeri prominent; disk coarsely striate, the intervals flat, coarsely punctate, the punctures elongate-oval, nearly in mutual contact. *Prosternum* broadly, feebly impressed, with an abrupt and extremely deep, transversely oval pit, just behind the apical margin, the coxæ separated by about one-half of their own width. Length 4.5–5.0 mm.; width 2.2–2.4 mm.

North Carolina; Texas (Austin); Colorado.

Described from the female. In the male the beak is deeply, coarsely, longitudinally punctato-rugulose, with the antennæ inserted far beyond the middle, the prosternum more deeply impressed along the middle, and the anterior coxæ still more narrowly separated, but the very deep transverse subapical pit is almost similar to that of the female. In antennal structure the male differs from the female in having the second funicular joint shorter, the outer joints more transverse and obliquely truncate at apex, and the



basal joint of the club with a short acute erect tooth on the inner side. This is a very distinct and interesting species.

The female from Colorado is very densely squamose above, and the species probably varies in vestiture to as great a degree as *salebrosus*.

### CENTRINOPUS n. gen.

In this genus the beak is long, very slender and strongly arcuate, with the antennæ inserted near basal third, the scape short and extending almost to the eyes, the basal joint of the funicle long, the second short and the club rather small, with its basal joint unusually large.

The mandibles are well developed, quite distinctly notched within near the apex, but with the external outline nearly straight; when closed they are scarcely at all decussate and form together an anteriorly prominent ogive. The prosternum is deeply canaliculate along the middle in the female, and with a still deeper elongate-oval excavation in the male, being armed in the latter sex before each coxa with a well-developed, abruptly bent, corneous process. The anterior coxæ are somewhat prominent and narrowly separated, being appreciably more approximate in the male than in the female. The mes-epimera are exposed from above and the scutellum is very small and densely squamose. The pygidium is completely covered in both sexes, and the met-episterna moderately wide and generally more densely squamose than the adjoining surfaces.

The form of the body is somewhat oblong-oval, the humeral callus feebly developed, and the general habitus reminds us considerably of *Limnobaris grisea*. In the male the abdomen is broadly impressed in the middle toward base, the impressed area clothed with more slender, sparser but recumbent squamules. Our two species may be identified by the following characters:—

- |   |                     |
|---|---------------------|
| Prothorax feebly transverse; pronotum not conspicuously trivittate, the scales uniform in coloration but not in size and density; elytra abruptly much wider than the prothorax, the alternate intervals simply more broadly squamose.....  | 1 <b>helvinus</b>   |
| Prothorax more transverse; pronotum with three distinct vittæ, the squamules of the intermediate regions not only finer and sparser but darker in color; elytra but slightly wider than the prothorax, with the alternate intervals much more broadly, densely and conspicuously clothed with paler scales..... | 2 <b>alternatus</b> |

1 **Centrinopus helvinus** n. sp.—Oval, convex, dark piceous in color, the beak, antennæ and legs more or less rufescent; vestiture pale ochreous-yellow, squamiform, the scales dense beneath especially on the met-episterna; on the pronotum they are fine on the flanks beneath, then coarser and closer in a sublateral vitta, then sparse and fine to the median line where they are again coarser and denser, especially toward base; on the elytra they are more broadly oval, more whitish and densely, unevenly distributed throughout all the intervals, especially on the rather broader third, fifth and seventh. *Head* densely punctured and squamose toward apex, the basal portions of the beak also densely squamose but with the scales erect and bristling, the beak slender, evenly, rather strongly arcuate, a little longer than the head and prothorax, deeply, rather coarsely punctured and longitudinally furrowed but shining, the two punctate grooves lying along the sides of the median impunctate line especially evident; antennæ with the basal joint of the funicle rather longer than the next three, the second but slightly longer than the third, the club moderate, robust, abrupt, oval, pointed, as long as the preceding four joints combined, densely pubescent, with the basal joint composing fully one-half of the mass, the annulations strong, the successive rings decreasing rather abruptly in transverse diameter. *Prothorax* one-third wider than long, the sides very feebly convergent and nearly straight to slightly beyond apical third, then broadly rounded, strongly convergent and feebly sinuate to the apex, which is truncate and not quite one-half as wide as the base, the latter transverse, broadly sinuate toward the median lobe which is very small but abrupt and prominent; disk densely, not coarsely punctured. *Elytra* abruptly one-fourth wider than the prothorax, rather more than twice as long as the latter, the outline hemi-elliptical, the humeri very small and scarcely at all prominent; disk deeply but not coarsely striate, the intervals flat and from two to three times as wide as the grooves. *Prosternum* with an extremely deep elongate-oval excavation, and with a corneous process before each coxa, the process very thick and erect at base, but then abruptly and angularly bent obliquely forward becoming rapidly finely acuminate, the coxæ rather prominent, separated by about one-fourth of their own width. Length 1.9–2.7 mm.; width 0.8–1.2 mm.

Indiana; Illinois.

The description is taken from the male, the female being similar in form and structure of the beak and antennæ, but having the prosternum simply longitudinally and deeply channeled, the channel squamose and limited at the sides by an obtusely elevated ridge; the coxæ are a little less approximate, being separated by nearly one-half of their own width. The measurements given above are taken from the extremes of a series of over one hundred specimens.

2 **Centrinopus alternatus** n. sp.—Oblong-oval, rather robust, convex, piceous-black; elytra toward the sides rufescent, the antennæ and legs dark rufo-piceous; vestiture yellowish, consisting of fine, not dense squam-

ules beneath; on the upper surface the scales are pale and dark brown, the former forming three vittæ on the pronotum and densely clothing intervals three, five and seven, the line of the third and seventh uniting near the apex and continuing thence as a single short line to the apical angle; other intervals having very narrow inconspicuous lines composed of more slender, whitish and brown squamules. *Head* densely punctate and squamulose anteriorly, the base of the beak bristling with erect scales, the beak slender, smooth, polished, rather coarsely but not densely lineato-punctate, strongly, evenly arcuate and a little longer than the head and prothorax, the basal joint of the funicle as long as the next three, the club small but robust, oval, densely pubescent, scarcely as long as the preceding four joints combined, with the basal joint composing nearly three-fifths of the mass, the remaining rings short but very distinct. *Prothorax* two fifths wider than long, the sides subparallel and feebly arcuate in basal two-thirds, then rounded, strongly convergent and broadly constricted to the apex, which is about one-half as wide as the base, the latter transverse and perfectly straight, the median lobe small but abrupt, prominent; disk very densely but not coarsely punctate. *Elytra* but slightly wider than the prothorax and fully twice as long, hemi elliptical, the humeri scarcely at all prominent; disk deeply, not very coarsely striate, the intervals flat, from two to three times as wide as the grooves, moderately densely, deeply but not coarsely punctate. Under surface extremely densely punctate throughout. *Prosternum* deeply, longitudinally impressed, squamose, separating the coxæ by not quite one-half of their own width. Length 3.0 mm.; width 1.35 mm.

#### Maryland.

A single female. I have, however, seen another specimen in the cabinet of Mr. Jülich. This is a very distinct form, easily distinguishable from *helvinus* by its larger size, more transverse and trivittate prothorax, and by the alternately conspicuously squamose elytral intervals. It closely resembles a small *Limnobaris grisea*.

#### LINONOTUS n. gen.

This genus is founded upon a male representative in the LeConte cabinet, which cannot be distinguished in any way from Boheman's *Centrinus distinctus*, as described from Brazil; it will include also the Brazilian *C. westwoodi*, *parallelus* and other allied species.

The body is stout, rhomboidal and convex, the beak long, more or less slender, arcuate and slightly gibbous above at base, the constriction separating it from the head being in the form of a deep transverse and extremely pronounced furrow. The mandibles are large, prominent, non-decussate and strongly dentellate along their inner edge. Antennæ inserted behind the middle, slender, the basal joint of the funicle long and equal to the next three together, the

club small, narrowly oval, pointed and with its basal joint constituting nearly one-half of the mass.

The prothorax is subtubulate at apex, the anterior coxæ large, prominent and separated by not quite their own width, the prosternum in the male having a large, oval, extremely deep median excavation and two ante-coxal processes of great length, extending far in advance of the head, and upwardly everted at apex. The scutellum is large, slightly trapezoidal, smooth, polished, flat, entirely unimpressed and feebly, sparsely punctulate toward base only.<sup>1</sup>

1 **Linonotus distinctus** Boh.—Sch. Curc., VIII, i, p. 187 (Centrinus).

Black, polished, the pronotum with two broad lateral vittæ of orange-red scales, the vittæ abruptly flexed beneath anteriorly, extending to the prosternal excavation. Elytra each with a single broad vitta of the same color, occupying the entire width of intervals three and four, and extending from the base to apical fourth. Met-episterna and sides of the last three ventral segments similarly clothed. Length 5.8 mm.; width 3.1 mm.

The male referred to above is labeled "Texas," and, if this is correct, indicates a distribution similar to that of *Hemirhipus fascicularis*.

### PYCHYBARIS.

LeConte—Proc. Am. Phil. Soc., XV, p. 302.

The original type is still the only known species assignable to this distinct and somewhat isolated genus. The body is short and very robust, feebly setose, polished and, although normally centri-niform in pygidial structure, possesses many of the characteristics of *Onychobaris*, as remarked by its author.

The beak is rather long, strongly arcuate, with the punctures not very dense and arranged in subimpressed series, more confused at the sides toward base, the mandibles not in the least decussate when closed, but coming together on the axial line as in *Centrinus*. The antennæ are inserted far behind the middle of the beak, with the scrobes moderately oblique, attaining the eyes, the scape short, the funicle gradually thick toward apex, almost continuous in outline

<sup>1</sup> Since this was written I have received specimens of the true *distinctus*, taken near Rio de Janeiro, and find that they are identical with the Texan representative.



with the finely and densely pubescent club, the latter moderate in size, oval, with the basal joint rather large.

The prosternum is flat, broad between the coxæ, the latter separated by their own width, the external sides of the cavities prolonged anteriorly for a short distance by deep and conspicuous closed fissures, as noticeable in some other genera of the present tribe; anteriorly, the apical constriction is totally obsolete, but in its place there are the two deep and somewhat approximate foveæ, with connecting groove, as in *Onychobaris*, each fovea being prolonged posteriorly for a short distance.

The scutellum is moderate in size, flat and almost circular. Legs moderately robust, the tibiæ rather roughly sculptured and feebly fluted externally; but this character is apparently not very important from a systematic point of view, as it recurs in several other genera, not especially related, such as *Limnobaris*. Tarsi robust, with the third joint very large and deeply bilobed, the claws small, rather slender, free and divergent.

1 ***Pachybaris porosa*** Lec.—Proc. Am. Phil. Soc., XV, p. 302.

Robust, convex, polished, black, the beak, legs and antennæ more or less rufo-piceous; vestiture very sparse, consisting of minute scarcely distinguishable setæ on the prothorax, and longer posteriorly recumbent and robust setæ on the elytra, where they are piceous in color and inconspicuous, very small but whitish on the under surface. Beak slender, strongly arcuate, striato-punctate, fully as long as the head and prothorax in the female and quite distinctly shorter in the male, the antennæ moderate, the scape short, first joint of the funicle as long as the next four, second a little longer than wide and slightly longer than the third. Prothorax short, two-thirds wider than long, the sides broadly rounded and strongly convergent anteriorly, feebly constricted but not tubulate at apex, becoming nearly parallel toward base, the latter transverse, the median lobe small, prominent and truncate, the truncation feebly emarginate to receive the scutellum; disk rather coarsely, deeply but not closely punctate, without impunctate line. Elytra scarcely perceptibly wider than the prothorax and three-fourths longer than the latter, not quite as long as wide; outline parabolic; disk with very coarse deep obsoletely crenulate grooves, the intervals about one-half wider than the grooves, each with a single series of very coarse deep rounded and close-set punctures. Length 3.8–4.0 mm.; width 2.3 mm.

Florida (New Smyrna and Biscayne Bay). Apparently not uncommon and belonging to the subtropical fauna of the peninsula. The allusion in the original description to whitish hairs on the elytra is inexact.

### MICROCHOLUS.

LeConte—Proc. Am. Phil. Soc., XV, p. 303.

This isolated genus is characterized by a broad, moderately convex body, with normally striate elytra, an unimpressed prosternum, non-tubulate prothorax and small tarsal claws, and differs greatly from Oomorphidius, under which name I have separated two of the species assigned to it by its author, in several important characters as given in the table.

The mandibles are rather long, prominent, feebly arcuate in external outline, scarcely at all or feebly decussate when closed, and much more angulate anteriorly in this state than in Oomorphidius and Eisonyx. In fact in this and several other ways, Microcholus forms a tolerably satisfactory intermediate between the genera mentioned and Centrinus.

The two species at present known should be separated subgenerically as follows:—

#### Subgenus I.

Beak compressed toward base, minutely, feebly punctate even at the sides, the apex flattened and subdilated; scutellum rather large, elongate-oval and tumid; elytral striæ much coarser, impunctate; tarsal claws very stout; integuments nearly glabrous above.....1 **striatus**

#### Subgenus II.

Beak cylindrical, neither compressed toward base nor flattened at apex; scutellum very minute, triangular; elytral striæ fine, remotely punctate; tarsal claws very small but slender; integuments rather densely but unevenly squamose.....2 **puncticollis**

In general outline of the body *M. puncticollis* almost perfectly resembles *Simocopsis umbrina* Pasc.; the beak is however quite different.

#### I.

1 **Microcholus striatus** Lec.—Proc. Am. Phil. Soc., XV, p. 304.

Broadly oblong-oval, moderately convex, black, the legs rufopiceous; pronotum polished, the elytra slightly alutaceous; integuments almost glabrous above, with a cluster of large white scales

at the base of the pronotum at each side and a few before the scutellum, also several widely dispersed on the elytra and a small group at the base of the third interval; under surface sparsely, the legs, meso- and met-episterna and sides of the last three ventral segments more or less densely, clothed with large white scales. Head separated from the beak by a very feeble impression, the beak fully as long as the prothorax, flattened near the apex and strongly compressed toward base, strongly, evenly arcuate, sparsely, very minutely punctate throughout and moderately stout; antennæ slender, the basal joint of the funicle slender, fully as long as the next four, the second slender and as long as the next two, club small, stout, densely pubescent, with the basal joint constituting rather more than one-half the mass as in *Oomorphidius*. Prothorax scarcely two-fifths wider than long, the sides broadly arcuate and gradually strongly convergent from the obtusely rounded basal angles to the apex, the latter not tubulate, the constriction very feeble; base transverse, the median lobe wide but very feeble; disk finely, sparsely punctate. Scutellum well-developed, elongate-oval and tumid. Elytra not at all wider than the prothorax, two-thirds longer than the latter and about as long as wide, the striae rather fine but deep, with the edges obtuse, the intervals wide, each with a single somewhat uneven series of fine distant punctures. Anterior coxæ separated by rather less than one-third of their width, the tarsal claws small, short, very thick but free and moderately divergent. Length 4.5 mm.; width 2.3 mm.

Florida (Lake Harney). Cab. LeConte. Represented, as far as known, by the unique type. The upper surface in the type is not denuded of scales as supposed by LeConte; the punctures, other than those very remote ones which bear the long isolated scales, bear each an infinitesimal seta.

## II.

2 ***Microcholus puncticollis*** Lec.—Proc. Am. Phil. Soc., XV, p. 304.

Broadly oblong-oval, the elytra rapidly narrowed and sinuate at the sides behind; body and antennæ black, smooth and shining, the legs rufous; under surface, legs and elytra covered rather densely with large oval white scales, which, on the elytra, are a little closer on the third and fifth intervals toward base and behind the middle; pronotum more sparsely covered with elongate squamules, except a

wide vitta at lateral sixth, which is more densely squamose. Beak glabrous but densely squamose near the base, rather stout, cylindrical and evenly, strongly arcuate throughout, distinctly punctate and nearly as long as the head and prothorax; antennæ very slender, nearly as in *striatus*, but with the first funicular joint as long as the next three. Prothorax slightly dilated, subparallel and broadly rounded at the sides, narrowed toward the apex and quite distinctly constricted but not tubulate, about four-fifths wider than long and one-half as long as the elytra, the base transverse, with the median lobe subobsolete; disk sparsely, somewhat unevenly, finely but distinctly punctate. Scutellum extremely small, flat, equilatero-triangular. Elytra at base not quite as wide as the prothorax, very slightly longer than wide, the striæ fine but abrupt, remotely and distinctly punctate, the intervals confusedly and minutely punctate. Prosternum separating the large anterior coxæ by scarcely more than one-fourth of their own width; tarsal claws small but slender, free and moderately divergent. Length 3.4–3.8 mm.; width 1.6–1.8 mm.

Florida (Baldwin). This species differs extremely from *striatus* in many important structural characters, and is the only one which has been taken in any number. The scales are rather easily abraded. The epistomal lobe is very short and narrow, occupying the median third of the width, and limited at each side by a long deep oblique and arcuate fissure, the apex broadly sinuate in the middle; in *striatus* it is more than twice as wide, not at all advanced and is transversely truncate at apex.

#### NICENTRUS n. gen.

The oblong-oval, sometimes almost cylindrical and convex form of the body, will readily serve to distinguish the species of this genus from those of *Centrinus*, where the outline is more rhomboidal. The beak is generally thick and rather short, differing but slightly in the sexes, often strongly compressed or flattened at the sides toward base, but, in *contractus*, becoming longer, cylindrical and almost impunctate, at least in the female. The antennæ are inserted at about the middle in the female or slightly beyond in the male. Mandibles rather well developed, nearly straight in external outline, with their inner edge dentellate; they are not decussate when closed, the form then being anteriorly prominent in angle or ogive.

The prosternum may be either canaliculate and feebly bicarinate along the middle or perfectly flat, sometimes flat in the female and



feebly impressed in the male, but always more or less narrowly separates the coxæ, and the ante-coxal corneous processes of the male, forming so characteristic a feature of *Centrinus*, are completely obsolete. The scutellum, legs and abdomen are nearly as in *Centrinus*, and the body is similarly squamose; the mes-epimera are, however, much less frequently visible from above in the reëntrant angle between the prothorax and elytra.

Our species are not very numerous and may be recognized as follows:—

Prosternum flat or approximately so.

Anterior coxæ separated by less than one-half of their own width; beak moderately stout and subequal throughout.

Squamules of the pronotum abruptly and broadly dense and conspicuous at the sides, and sometimes, also, narrowly along the middle, the vestiture of the intervening regions consisting of small and more or less inconspicuous squamules.

Punctures of the pronotum contiguous and more or less longitudinally coalescent; scales of the elytra disposed in a single even series on each interval .....1 **lineicollis**

Punctures of the pronotum rather widely separated; elytral scales disposed in one or more series on each interval, quite broadly confused on the third and still more broadly on the fifth .....2 **ingenus**

Squamules of the pronotum uniform in structure throughout and but slightly uneven in distribution, usually larger and gradually a little denser toward the sides.

Anterior coxæ very approximate, separated by about one-fourth of their own width or less.

Prothorax about as long as wide, coarsely, rugosely but not very deeply sculptured; body narrow .....3 **scitulus**

Prothorax distinctly wider than long, the body more broadly oval.

4 **decipiens**

Anterior coxæ smaller and separated by nearly one-half of their own width; very small species; prosternum perfectly flat.

5 **effetus**

Anterior coxæ separated by distinctly more than one-half of their own width; beak longer, more slender and almost impunctate; body shorter and broader, the second funicular joint much longer....6 **contractus**

Prosternum with a narrow and deep but squamose longitudinal impression, limited on each side by an obtusely prominent ridge; beak very stout, especially toward base in the male .....7 **canus**

1 **Nicentrus lineicollis** Boh.—Sch. Cur., VIII, i, p. 221 (*Centrinus*).

Oblong-oval, narrow, subparallel, convex, black, rather dull; vestiture whitish, the slender scales of the upper surface distinct

near the sides and along a narrow median line of the pronotum, and disposed in a nearly even single line along each elytral interval; intermediate areas of the pronotum clothed with exceedingly minute setæ; scales of the under surface broadly oval and dense, except toward the sides of the prothorax, where they are fine sparse and subdenuded. Beak stout, moderately arcuate, varying in length from scarcely as long as the prothorax to as long as the head and prothorax, the antennæ inserted a little beyond the middle, the basal joint of the funicle as long as the next two, the second one-half longer than the third, the club moderate, oval, densely pubescent, with the basal joint much less than one-half the mass. Prosternum not impressed, feebly, transversely constricted toward the middle behind the apical margin, separating the anterior coxæ in the male by less than one-fifth of their own width, but in the female by a much more appreciable distance. Length 2.3–3.5 mm.; width 0.8–1.4 mm.

The series before me is from Massachusetts, District of Columbia and Texas. The beak varies considerably in length, irrespective of the usual sexual difference, which is not remarkably pronounced, and the elytral squamules are sometimes distinctly shorter and broader. I have retained the name given by LeConte to this species, although it differs from Boheman's description of the Mexican type in its piceous-black and not rufo-ferruginous legs, and the statement "*antennæ apicem rostri propius insertæ*," is almost irreconcilable. It is quite probable that there are several closely allied species confounded here, but my material is not sufficiently extensive to properly define them.

**2 *Nicentrus ingenuus* n. sp.**—Oblong-oval, black and somewhat shining throughout, the legs with a feeble rufo-piceous tinge; vestiture consisting of pale yellowish scales, broad and dense beneath, elongate and narrower on the elytra, where they are disposed in from one to two series on the intervals, the lines of the third and fifth wider and more conspicuous; on the pronotum the squamules are very small, dark in color and entirely inconspicuous, except in lateral fifth or sixth, where they become abruptly broad, denser and pale yellowish, also visible along the median line especially toward base. *Head* finely but strongly punctured, the impression very feeble, not foveate; beak moderately stout, cylindrical, deeply, densely punctate and subrugulose, not quite as long as the head and prothorax, strongly, abruptly bent at base and also strongly but more gradually arcuate toward apex; antennæ inserted just beyond the middle, the basal joint of the funicle unusually short, not longer than the next two, the second much more slender than the first and fully three-fourths as long, subequal to the next two, club about as long as the four

preceding joints combined. *Prothorax* one-third wider than long, the sides feebly convergent, broadly, evenly and feebly arcuate nearly to the apex, then gradually more strongly convergent, but not at all sinuate, to the apex, the latter truncate and one-half as wide as the base, which is straight and transverse, the lobe rather small but distinctly prominent; disk with deep and moderately large punctures, which are perforate and rather widely separated, but somewhat unevenly distributed, the impunctate line narrow but distinct, even and entire. Scutellum very densely squamose. *Elytra* slightly wider than the prothorax and about four-fifths longer, the sides quite strongly convergent throughout, the apex somewhat narrowly rounded; disk rather coarsely, deeply striate, the intervals from one-half to once wider than the grooves, closely, deeply, confusedly and somewhat coarsely punctured throughout. *Abdomen* densely squamose. Prosternum perfectly flat, separating the rather large coxæ by one-fifth of their own width. Length 3.8–4.0 mm.; width 1.7–1.8 mm.

Illinois; Iowa; Texas.

This species is not closely allied to any other, although belonging in the neighborhood of *decipiens*; it differs in its much more abbreviated basal joint of the antennal funicle and very markedly in the nature of the pronotal sculpture and vestiture. The type is a female; in the male the beak is a little shorter and thicker, with the antennæ inserted at apical two-fifths. Three specimens.

**3 *Nicentrus scitulus* n. sp.**—Elongate-oval, convex, black and shining throughout, the legs somewhat piceous; vestiture white, consisting of large dense scales beneath and narrower sparsely placed squamules above, the latter more evident toward the sides of the pronotum but not forming a definite vitta, not denser along the median line; on the elytra they form a single or partially double line on each interval. *Head* finely but deeply, rather closely punctured, not squamose, the impression entirely obsolete; beak moderately thick, rather feebly, evenly arcuate, coarsely, deeply, linearly punctate throughout at the sides and longitudinally furrowed, nearly as long as the head and prothorax, the antennæ inserted near apical two-fifths, the scape rather long but not attaining the eye, the basal joint of the funicle as long as the next three, the second one-half longer than the third, the club rather small, oval, densely pubescent, about as long as the preceding four joints combined. *Prothorax* very nearly as long as wide, the sides broadly, evenly, feebly arcuate and convergent anteriorly, becoming nearly parallel in basal two-thirds, the apical constriction completely obsolete; apex truncate, fully one-half as wide as the base, the latter transverse and straight, the median lobe one-third the total width, prominent; disk without distinct median line, the punctures coarse, not very deep and partially coalescent, forming longitudinal rugæ. Scutellum quadrate, squamose, the apical angles acute and prominent. *Elytra* a little wider than the prothorax and almost twice as long, the humeri small but decidedly prominent, the sides behind them evenly and sensibly convergent, the apex rather abruptly but not

broadly rounded; disk with fine deep and abrupt striae, the intervals flat, from two to three times as wide as the grooves, coarsely confusedly and moderately closely punctured. Prosternum not impressed, with a small transverse stria at the middle behind the apical margin, the coxæ separated by less than one-fifth of their own width. Length 3.0 mm.; width 1.15 mm.

Texas.

The sex of the single specimen before me is not determinable with certainty. It is somewhat allied to *decipiens*, but differs in its much narrower and more elongate-oval form and in the long slender scales of the elytra.

4 **Nicentrus decipiens** Lec.—Proc. Am. Phil. Soc., XV, p. 313 (Centrinus).

Oblong-oval, convex, moderately shining, black, the legs rufous; vestiture white, consisting of sparse slender squamules on the pronotum, which become gradually broader and denser toward the sides especially near the base; on the elytra the scales are large, elongate-oval, conspicuous and unevenly arranged in from one to two rows on each interval, very white and dense beneath. Beak moderately stout, not distinctly thicker toward base, evenly arcuate, as long as the prothorax in the male and but slightly longer and thinner in the female, densely punctured and rugulose laterally, but not as compressed as in *canus*; antennæ inserted at the middle in the female or just beyond in the male, the first funicular joint as long as the next three, still longer in the female, the second not as long as the third and fourth; club rather small. Prothorax fully one-third wider than long, the sides parallel and feebly arcuate in basal two-thirds, then broadly rounded and convergent, the apical constriction obsolete; disk not very coarsely but deeply and densely punctate, the median line almost completely obsolete but sometimes visible as a fine cariniform line. Scutellum small, densely squamose. Elytra but very slightly wider than the prothorax, nearly four-fifths longer than the latter, somewhat narrowly hemi-elliptical in form, the humeri but slightly prominent; disk with deep abrupt and somewhat coarse grooves, the intervals flat, two to three times as wide as the grooves, rather finely, confusedly, not very densely but subrugosely punctured. Prosternum feebly and broadly impressed along the middle, the coxæ separated by about one-fourth of their own width. Length 2.8–3.7 mm.; width 1.25–1.6 mm.

Florida (Cedar Keys and Haw Creek). This species bears a deceptive resemblance to *canus*, but differs greatly in its less robust



beak, non-sulcate prosternum, more narrowly squamose elytral intervals, subobsolete median line and finer punctures of the pronotum, and in its smaller size. Three specimens.

5 **Nicentrus effetus** n. sp.—Oblong-oval, moderately convex, black, the legs red; integuments rather smooth, moderately shining; vestiture white, consisting of slender sparse squamules on the pronotum, larger and a little closer toward the sides and on the median line toward base; on the elytra broader and whiter but still narrow, disposed in a single almost even series on each interval, sometimes partially double on the third, fifth and seventh toward base; scales of the under surface large but sparse on the abdomen, dense on the met-episterna. *Head* finely, strongly, rather closely punctate, the beak somewhat slender, cylindrical, smooth, finely seriato-punctate, more closely so along the sides, about as long as the head and prothorax, rather strongly arcuate in basal half but nearly straight thence to the apex; antennæ inserted at the middle, the basal joint of the funicle as long as the next three, rather stout, second but slightly elongate, club small. *Prothorax* fully one-third wider than long, the sides parallel or feebly divergent from the base to apical third and nearly straight, then broadly rounded and strongly convergent to the apex, the constriction completely obsolete; apex truncate, rather more than one-half as wide as the base, the latter transverse, broadly, feebly bisinuate, the median lobe small but somewhat prominent; disk without trace of impunctate line, the punctures small and distinctly separated. Scutellum small, quadrate or rounded, very densely squamose. *Elytra* very slightly wider than the prothorax and nearly twice as long, hemi-elliptical, the humeri but slightly prominent; disk deeply and abruptly striate, the intervals flat, about twice as wide as the grooves, each with a tolerably even single series of small deep punctures. Prosternum flat, separating the coxæ by fully two-fifths of their own width. Length 2.2 mm.; width 0.85 mm.

Florida (Haw Creek).

The single specimen is a female and represents a species allied to *decipiens*, but differing in its much smaller size, longer elytra with uniseriate intervals, and in many other characters.

6 **Nicentrus contractus** n. sp.—Oblong-oval, convex, stout, black and but feebly shining, the legs not paler; vestiture consisting of whitish scales, very fine, sparse and almost uniformly distributed on the pronotum, broader, denser and widely confused on all the elytral intervals, and very broad and dense throughout beneath. *Head* finely but deeply, somewhat closely punctured, the impression almost completely obsolete and with a deep median fovea; beak long, rather slender, cylindrical, evenly, rather strongly arcuate, polished and almost completely impunctate except at base, where there are also a few squamules, and where the thickness becomes somewhat greater, fully one-half as long as the body; antennæ inserted distinctly beyond the middle, the second funicular joint unusually elongate, more than three-fourths as long as the first and nearly as long as the next three; club

moderate, stout, oval, densely pubescent. *Prothorax* short, three-fourths wider than long, the sides broadly arcuate, becoming nearly parallel toward base, strongly convergent, broadly and just visibly sinuate near the apex, the latter truncate and not quite one-half as wide as the base, which is straight and transverse, the median lobe one-fourth of the total width, prominent and sinuato-truncate at apex; disk somewhat coarsely, deeply, densely punctate, the punctures tending slightly to coalesce longitudinally, the impunctate line narrow but almost entire. *Scutellum* rather large, transverse, very densely and conspicuously albedo-squamose. *Elytra* but little wider and about four-fifths longer than the prothorax, scarcely longer than wide, hemi-elliptical, the humeri slightly oblique to the base of the prothorax, feebly tumid and but slightly prominent; disk deeply but not very coarsely striate, the intervals flat, from two to three times as wide as the grooves and all deeply, densely and confusedly punctate. *Abdomen* densely squamose. *Prosternum* flat, with a transverse nude excavation near the apical margin, the coxæ separated by three-fifths of their own width. Length 3.2 mm.; width 1.65 mm.

#### Florida.

In its longer, polished and almost impunctate beak, more elongate second funicular joint and rather more widely distant anterior coxæ, as well as in its shorter and broader bodily form, this species is decidedly aberrant; but all the remaining characters seem to coincide with those of the present genus. The single specimen appears to be a female, and, in the other sex, the beak is very likely shorter and more punctate as in the group of *Centrinus* containing *denticornis*, to which the species of *Nicentrus* bear some analogy in other respects also.

**7 *Nicentrus canus* Lec.**—Proc. Am. Phil. Soc., XV, p. 421 (*Centrinus*).

Rather stout, oblong-oval, convex, moderately shining, black, the legs rufous; vestiture whitish, consisting of long slender squamules, moderately densely and evenly distributed, a little broader and closer on the under surface. Beak in the male stout, becoming very thick toward base, moderately arcuate, scarcely longer than the prothorax, coarsely, deeply but not very densely, lineately punctate and grooved, the antennæ inserted distinctly beyond the middle, the basal joint of the funicle longer than the next two, the second three-fifths as long as the first and as long as the succeeding two, three to seven nearly equal and subquadrate; club small, rather narrowly oval. *Prothorax* very nearly as long as wide, the sides parallel and feebly arcuate in basal two-thirds, then broadly rounded and convergent to the apex, which is distinctly less than one-half as wide as the base, apical con-

striction very feeble; disk coarsely, moderately closely punctate, the punctures tending slightly to coalesce longitudinally; median impunctate line distinct except toward the apex. Elytra only just visibly wider than the prothorax, the sides feebly convergent, the apex not very narrowly rounded; disk finely but deeply striate, the intervals from two to three times as wide as the grooves, rather coarsely, moderately densely, rugosely and indistinctly punctate throughout their widths. Prosternum deeply channeled along the middle, the groove squamose and limited at each side by an elevated straight ridge, the coxæ separated by nearly one-third of their own width. Length 4.6–5.0 mm.; width 1.9–2.1 mm.

Florida (Enterprise and Haw Creek). In the female the antennæ are inserted at the middle of the beak, and the first joint of the funicle is a little longer, the second shorter; the beak however does not differ much from that of the male, being merely a little less stout, somewhat less coarsely punctate and about as long as the head and prothorax. The statements in the original description, that the beak is slender and the anterior coxæ widely separated, are greatly misleading.

#### **CENTRINITES** n. gen.

The chief characters differentiating this genus from *Centrinus*, are those which relate to mandibular and antennal structure, but, although in several other respects the single species representing it is somewhat peculiar, it cannot be denied that *Centrinites* is one of the few unsatisfactory genera necessitated by a mandibular basis of classification—unsatisfactory because there is not a sufficiently great peculiarity of habitus. I believe, however, that any other taxonomic basis for the genera in this part of the Barini, would give rise to much more pronounced and wide-spread ambiguity.

The mandibles in *Centrinites* are nearly as in *Nicentrus*, very feebly decussate and rather prominent when closed, but at the same time quite deeply notched within near the apex. The antennæ are inserted slightly beyond the middle of the beak, and the outer joints of the funicle are finely pubescent like the club, having also, however, the usual long bristling setæ or squamules; the outer joints do not merge gradually into the club, the latter being sensibly abrupt.

The prosternum is impressed along the middle, very narrowly separating the coxæ, and the prothorax is tubulate at apex. Mes-

epimera slightly visible from above. Scutellum sparsely clothed with dark-brown squamules. Pygidium completely covered, the fifth ventral segment not as long as the two preceding together. Met-episterna narrow. Tarsi normal, the claws moderate, free and divergent. In some of these characters the genus is related to *Nicentrus*, but the strongly tubulate prothorax and rhomboidal form of the body will readily distinguish them.

1 **Centrinites strigicollis** n. sp.—Rhomboid-oval, moderately stout, convex, shining, black, the tibiae, tarsi and antennae more or less piceous; vestiture consisting of elongate slender white scales and slightly smaller piceous squamules, the former broadly along the sides and on the basal lobe of the pronotum, and also on elytral intervals two, near the base and toward apex, four and six broadly, and three, five and seven in single sparse lines which are less distinct toward base and apex; under surface rather sparsely clothed with white scales, the met-episterna very densely so throughout. *Head* finely but strongly, rather closely punctured, the transverse impression broadly angulate but distinct; beak somewhat stout but not much thicker toward base, evenly, distinctly arcuate, fully as long as the head and prothorax, the flattened sides deeply densely and rugosely punctate, the dorsal surface polished and with an even series of small punctures at each side of the impunctate line; antennae inserted a little beyond the middle, the scape extending three-fourths the distance thence to the eye, the basal joint of the funicle fully as long as the next three, the second less than one-half as long as the first and one-half longer than the third, outer joints finely pubescent, and also coarsely setose, club finely, densely pubescent, moderate in size, the basal joint forming nearly one-half the mass. *Prothorax* two-thirds wider than long, the sides feebly convergent and nearly straight to apical third, then strongly rounded to the well-marked constriction; apex tubulate and fully one-half as wide as the base, the latter transverse, sinuate at each side of the small moderately distinct median lobe; disk with long deep longitudinal rugae, the median line very finely carinate. Scutellum quadrate, emarginate behind, sparsely clothed with brown squamules. *Elytra* distinctly wider than the prothorax and more than twice as long, the humeri rather prominent but obtuse; sides strongly convergent, the apex somewhat narrowly rounded; disk moderately and not very abruptly striate, the intervals flat, about twice as wide as the grooves, the first, third, fifth and seventh uniseriately punctate, the others confusedly so, the punctures moderate, deep, not very dense. Prosternum with a deep squamose parallel-sided longitudinal impression, ending behind the anterior margin in a small transverse nude and deeper pit, the coxae separated by one-fourth of their own width. Length 3.5 mm.; width 1.7 mm.

North Carolina (Hot Springs); Missouri.

This species bears a deceptive resemblance to *Centrinus tortuosus*, but is less robust and has the pale scales arranged in rows and not



sparsely sprinkled over the elytra. Its real isolation is shown not only by the characters which I have assumed to separate it generically, but by the very exceptional fact that the elytral intervals which are narrowly and uniseriately punctured and pubescent, are the third, fifth and seventh, while in the vast majority of genera these are the more conspicuously broad and pubescent intervals. The type appears to be a male.

### **CALANDRINUS.**

LeConte—Proc. Am. Phil. Soc., XV, p. 305.

This is one of the aberrant and specialized generic types so characteristic of the centrinide group of Barini, and is entirely isolated in general form of the body, as well as in tarsal structure. The beak is rather slender and arcuate, moderate in length and cylindrical, although rather rapidly dilated and noticeably flattened toward the truncate apex, and with peculiarly small, widely distant mandibles, which can apparently do little more than mutually touch when closed; they are strongly dentate externally near the base. The antennæ possess no exceptional features, but are slender, with the club small and less densely pubescent than usual. The impression separating the beak from the head is feeble and very broad. Prothorax rather large in comparison with the elytra, subequal to the latter in width or a little narrower, subcylindrical, with broadly rounded sides, strongly constricted at some distance behind the apex, the latter conically tubulate. Scutellum very small and rather deeply seated.

The prosternum is deeply, transversely constricted at a considerable distance behind the apex, but not otherwise modified, unimpressed, the anterior coxæ rather small and remote, usually separated by fully their own width. Legs rather long and somewhat slender, the tibiæ deeply sculptured and more or less ridged and fluted, the tarsi slender, with the third joint but slightly larger than the second, emarginate, glabrous beneath, with a small setose tuft near each apical angle; claws rather long, slender, free and widely divergent.

The three species which I have been obliged to recognize may be outlined in the following manner:—

Pronotal punctures smaller, although still comparatively coarse, denser, with a broad, fusiform, polished, and sharply limited impunctate line, which attains and becomes confluent with the broad apical impunctate margin.

- Elytral punctures very remote, the surface almost glabrous but squamose at the base, behind the scutellum and obliquely at the sides behind the middle; intervals extremely unequal in width, the striae finer and not noticeably punctate.....1 **grandicollis**
- Elytral punctures closer and larger, more confused, the striae much coarser, deep, distinctly punctate at the bottom; vestiture more abundant, densely squamose also in a sutural line behind the middle; intervals much less unequal in width; size somewhat larger.....2 **insignis**
- Pronotal punctures very coarse and not dense, with merely an elongate and ill-defined median area, toward which they become still sparser; elytra with an abbreviated post-scutellar spot which is covered with large white scales.....3 **obsoletus**

*Calandrinus* appears to be peculiar to the somewhat isolated zoological province embracing Colorado and the northern part of New Mexico.

1 ***Calandrinus grandicollis*** Lec.—Proc. Am. Phil. Soc., XV, p. 305.

Oblong-oval, strongly convex, polished, piceous-black, the beak, antennae and legs paler, rufous; integuments sparsely and unevenly squamose, the scales yellowish-white, long, slender and sparse on the pronotum, denser and larger toward the sides, there becoming whiter and broader toward base; on the elytra they are extremely sparse, long and very slender, becoming larger, dense and whiter toward base, behind the scutellum and in a small oblique spot behind the middle, from the third stria to the sides; most conspicuous beneath on the prosternum, elsewhere long, fine and sparse. Beak slender, cylindrical, evenly, moderately arcuate, as long as the head and prothorax, the basal joint of the antennal funicle fully as long as the next three, the second as long as the following two; club rather small, narrowly oval, pointed. Prothorax nearly as long as wide, the sides very feebly divergent and slightly arcuate from the base nearly to apical third, then broadly rounded, the constriction large and distinct; apex nearly three-fourths as wide as the base; disk coarsely, deeply and closely punctate, the impunctate line wide, fusiform, abruptly limited, smooth and polished, extending to the impunctate apical margin. Scutellum very small, deeply seated. Elytra oviform, narrowly rounded at apex, quite distinctly wider and scarcely more than one-half longer than the prothorax, but distinctly longer than wide, strongly arcuate at the sides near the base, the humeral callus not evident; striae abrupt, deep, moderately fine, the intervals flat, extremely unequal in width, the third as wide as the

first and second together, the fourth very narrow, not more than one-half wider than the grooves, each with a single series of small but deep, distant puncturés, which are broadly confused on the third, and, to some extent, on the fifth. Abdomen very coarsely and deeply punctured. Prosternum flat, broadly constricted behind the apex, separating the coxæ by about their own width. Length 2.8 mm.; width 1.2 mm.

Colorado. Cab. LeConte. Represented only by the unique type from which the description is taken. This species differs from *in-signis* in its smaller size, straighter and more convergent sides of the prothorax toward base, much more uneven and more sparsely punctate elytral intervals, and in many other characters.

2 **Calandrinus insignis** n. sp.—Ovulate, strongly convex, highly polished, the head alutaceous, blackish-piceous, the legs and beak rufous; vestiture consisting of long rather robust hairs, yellowish in color, sparse on the pronotum, becoming broader white denser and squamiform near the sides anteriorly and at lateral sixth toward base; on the elytra the yellowish slender squamules are moderately dense toward base, becoming denser white scales near the humeri, and also on intervals one, and four to seven, for a short distance behind the middle, the yellowish squamules elsewhere very sparse; under surface uniformly and rather sparsely clothed with elongate white scales. *Head* with a distinct, rather large frontal fovea, the impression almost completely obsolete; beak as long as the head and prothorax, arcuate, slender, finely, sparsely punctate, the punctures linearly arranged along the side of the impunctate line; antennæ nearly as in *grandicollis*. *Prothorax* very nearly as long as wide, the sides parallel, evenly, rather strongly arcuate in basal four-fifths, then rounded, convergent and broadly constricted to the apex; base feebly oblique and straight from the centre to each basal angle; disk with a wide subentire distinctly defined impunctate line, the punctures somewhat coarse, deep, very close but not quite in mutual contact. *Elytra* one-fourth longer than wide, nearly one-half longer than the prothorax, and, at basal fourth, a little wider than the disk of the latter, oval in form, the sides strongly arcuate toward base, thence convergent to the narrowly rounded apex, disk with coarse, deep, abrupt, remotely and distinctly punctate striæ, the intervals flat, from one-half wider than, to about twice as wide as the grooves, finely, sparsely and more or less confusedly punctate throughout. *Abdomen* coarsely, deeply punctate. Length 3.4 mm.; width 1.5 mm.

Colorado.

I owe the above-described type to the kindness of Mr. W. Jülich, in whose cabinet there is a series of several specimens. The species is easily distinguishable from *grandicollis* by the characters given in the table, and also by the coarser striæ and denser and more

confused interstitial punctuation, although the punctures tend to form single lines on the narrower intervals. The punctuation of the prothorax is nearly the same as in *grandicollis*, but the vestiture throughout the body is much more abundant and conspicuous, and there is a sutural line of broader white scales behind the middle in this species, which is entirely wanting and replaced by the usual fine sparse squamules in *grandicollis*.

3 **Calandrinus obsoletus** n. sp.—Cylindro-oval, very convex, polished, piceous, the legs and beak bright rufous; vestiture white, consisting of elongate squamules sparsely placed on the prothorax and elytra, becoming denser and more broadly oval on the latter toward base, especially in a broad line behind the scutellum and toward the humeri, and also along intervals four to six for a short distance behind the middle. Head with a small frontal fovea, the beak very slender, finely, sparsely punctate, as long as the head and prothorax, strongly, evenly arcuate, the antennæ slender, inserted just behind the middle, the first funicular joint slender, as long as the next three, the second one-half as long as the first, all the joints longer than wide except the seventh, which is a little transverse, club small, as long as the preceding four joints combined, rather thin, sparsely pubescent and slightly shining, with the basal joint large. Prothorax very nearly as long as wide; sides parallel and broadly arcuate to apical fourth, then rounded and constricted, the apex strongly subtubulate; base broadly, evenly arcuate, the median lobe obsolete; disk very coarsely, deeply punctate, without distinct impunctate line, the punctures rather uneven in size, form and distribution, but generally separated by distinctly less than their own diameters. Scutellum minute, deeply seated. Elytra slightly longer than wide, very slightly wider than the prothorax and one-half longer than the latter, ovalo-conoidal, narrowly rounded behind; disk rather coarsely, deeply striate, the intervals flat, from two to three times as wide as the striæ, each with a single line of fine distant and inconspicuous punctures. Length 2.8 mm.; width 1.25 mm.

Colorado.

Readily distinguishable from *grandicollis* and *insignis* by the much coarser, sparser punctures of the pronotum, and the entire absence of a well-defined median impunctate line, the punctures simply becoming sparser at the middle; the apical margin is, however, broadly impunctate, as in the species mentioned. A single specimen.

#### **CENTRINOGYNA** n. gen.

The two species which are referred to this interesting genus, are the most remarkable of the tribe in their wonderful sexual divergencies at the apex of the abdomen. In the male, the pygidium is



large, vertical, strongly convex and completely exposed, while in the female it is entirely covered, with the exception of a very small and barely distinguishable portion at the apex. In other words, assuming the division adopted by LeConte, which is still, without much doubt, the best that can be devised, the male is a normal baride, while the female is an equally pronounced centrinide. This of course destroys any idea of two perfectly isolated natural groups, and compels us to treat the genera as forming part of a single well-defined series. In fact the homogeneity of the entire tribe is proved by repeated parallelisms of structure throughout.

In *Centrinogyna* the body is elongate, parallel and somewhat depressed, nearly as in many species of *Limnobaris*. The beak is rather slender, arcuate, about as long as the prothorax, with the antennæ inserted distinctly beyond the middle, slender, moderate in length, the first funicular joint as long as the next four, the second slightly elongate but less than one-half as long as the first, the club oval, abrupt, densely pubescent and with the basal joint constituting very nearly one-half of the mass. Mandibles deeply notched within, acute, not noticeably overlapping when closed and then forming a prominent angle.

The prosternum is perfectly unimpressed, having the usual deep transverse constriction behind the apex but not otherwise modified, the anterior coxæ not very widely distant and separated by but slightly more than one-half of their own width, the prosternal process terminating midway of their length in a distinct transverse suture; behind this, the prosternum is but slightly produced, passing for only a short distance over the edge of the mesosternum, with the apex broadly and feebly sinuate in the middle. The prothorax is strongly tubulate at apex. Scutellum very small, subquadrate or a little longer than wide. Legs normal; tibiæ nearly smooth, the tarsal claws well developed, stout, free and divergent. Vestiture throughout consisting of very sparse slender setiform squamules, white in color and arranged in a single somewhat uneven semi-erect and bristling line on each of the elytral intervals.

This genus offers a good example of the polarity theory in the distribution of secondary sexual characters, advanced by Dr. LeConte, the beak and antennæ being quite devoid of any perceptible sexual differences, while those at the apex of the abdomen are exceptionally pronounced. The theory does not hold so well, however, in some other genera, as for example in several species of *Oxytelus*

which I have in mind, and fails completely in *Conoproctus* Lac. of the present tribe, where the sexual differences in the form of the beak, point of antennal insertion and structure of the pygidium, become extreme in *C. 4-pustulatus* Fab., as before described under the genus *Madarellus*.

The species may be thus distinguished:—

Piceous; legs rufous; setæ long and conspicuous; pronotum strongly and longitudinally strigose.....1 **strigata**  
 Black throughout, subglabrous, the setæ extremely sparse and short; pronotum more finely punctate, the punctures distinct, sometimes feebly coalescent longitudinally.....2 **procera**

1 **Centrinogyna strigata** Lec.—Proc. Am. Phil. Soc., XV, p. 421 (*Centrinus*).

The original description of what LeConte designates a remarkable species from an inspection of the female alone, is well given and ample for purposes of recognition, except that the anterior coxæ are only separated by about three-fifths of their own width. The beak is rather slender, evenly, moderately arcuate and does not differ appreciably in the sexes; it is sparsely punctured and has a very even line of small punctures along each side of the median impunctate line. The prothorax is very nearly as long as wide, parallel and feebly arcuate at the sides and abruptly, broadly and strongly tubulated at apex, the base transverse, the median lobe very small and almost obsolete; disk with longitudinally, closely, unevenly and deeply plicate or rugose sculpture, the impunctate line very distinctly defined, polished and somewhat elevated. The elytral striæ are moderately coarse, deep and abrupt, impunctate, the intervals flat, nearly three times as wide as the grooves, each with a single somewhat uneven series of rather small but deep, approximate punctures. Length 3.5–4.8 mm.; width 1.2–1.7 mm.

Colorado and Wyoming. Taken in abundance by Mr. Wickham at Greeley and Laramie.

2 **Centrinogyna procera** n. sp.—Elongate, parallel, moderately convex, shining, black throughout, the vestiture consisting of very small setiform squamules, which are exceedingly sparse and inconspicuous but more evident at the sides of the pronotum and last three ventral segments, and near the apex of the met-episterna. *Head* minutely, sparsely punctured, the transverse impression strong, broadly angulate in profile; beak rather thick, subcylindrical, evenly, rather feebly arcuate, as long as the prothorax, hardly differing in the sexes, but a little thicker and more punctate in the male, the

punctures rather fine, lineate dorsally but larger denser and confused at the sides; antennæ inserted near apical third, the scape long, first funicular joint as long as the next three, the second small, obconical, slightly longer than wide and about one-half longer than the third, outer joints transverse, club moderate, densely pubescent, the basal joint constituting more than one-half the mass and more sparsely pubescent near the base. *Prothorax* about as long as wide; sides parallel, evenly and broadly arcuate to apical sixth, then abruptly rounded to the deep constriction; the apex strongly tubulate, three-fourths as wide as the base, the latter transversely truncate, the median lobe small and feebly rounded; disk with a narrow distinct and entire impunctate line, the punctures rather fine but deep, uneven, not densely crowded, well separated transversely but tending slightly to longitudinal elongation or partial coalescence. Scutellum very small, quadrate, glabrous. *Elytra* equal in width to the prothorax and fully twice as long, the sides parallel, feebly convergent in apical third, the apex rather abruptly and not narrowly rounded; humeral callus almost obsolete; disk with moderately deep striæ, which become finer toward apex and coarser near the base; intervals nearly three times as wide as the grooves, each with a single series of rather small, uneven, approximate punctures, somewhat confused on the third. *Legs* short, the anterior and middle femora very robust, the posterior far less so. Length 4.0–4.7 mm.; width 1.3–1.7 mm.

California (San Francisco). Mr. Dunn.

In this species the pygidium of the male is large, broad, vertical, convex, moderately densely punctate, and completely exposed; in the female it is entirely covered by the elytra, with the exception of a scarcely visible fine lower margin. The prosternum is flat and the anterior coxæ separated by three-fourths of their own width. The male appears to be much less abundant than the female in both of these species. Five specimens.

### LIMNOBARIS.

Bedel—Fne. Col. Bas. Seine, VI, p. 183.

The mandibles in this genus are of a completely different type from those of *Centrinus*, for, instead of being prominent, perfectly non-decussate and totally devoid of internal inequality, they are here short, stout, strongly arcuate, deeply notched at apex and broadly decussate when closed, the anterior outline then being broadly, feebly arcuate and not in the least prominent. With this radical difference of structure, there is also a decided peculiarity of facies, the species of *Limnobaris* being narrow, parallel or oval, generally distinctly depressed, with feebly developed humeral callus and more or less glabrous integuments. Of the genera with promi-

nent mandibles, the closest ally of *Limnobaris* appears to be *Centrinogyna*, and, in this connection, it should be stated that in the former the tip of the pygidium is occasionally exposed, especially in the male.

The basal joint of the antennal funicle is generally long, the second decidedly short, becoming longer in the fifth group, and the club varies considerably, being moderately robust, with a large basal joint in the first group, but narrower and with a much shorter basal joint in the others. There is also considerable variation in the amplitude of the prosternal process between the coxæ, the latter being generally more or less remote, but occasionally narrowly separated, again demonstrating the slight weight of prosternal characters in some parts of the centrinide series. The prosternum is usually flat, but in some species may be flat in the female and deeply excavated in the male, and, in *longula*, is narrowly impressed along the middle in both sexes.

The beak varies in structure to a noticeable extent in the several subgeneric groups as detailed below, and in some of these sections, the prosternal processes of the male are invariably wanting, while in others they may or may not be present. In several species, which happen to belong to all of the subgenera except the first, the beak varies perceptibly in length in different individuals, necessitating some caution in separating the species. I have observed this variation in length in *prolixa*, *rectirostris*, *ebena*, and possibly *seminitens*, also, as before stated, in *Nicentrus lineicollis*.

The five sections, into which it is convenient to separate our species, may be outlined as follows:—

Antennal club more robust, with the basal joint large, constituting more than one-half of the mass and frequently more sparsely pubescent and shining toward base; beak generally thicker, more strongly and evenly arcuate and not tumid at base, the antennæ inserted distinctly beyond the middle in the male but more medially in the female; prosternum always widely separating the coxæ and never armed in the male; punctuation deeper, denser and more uneven as a rule, the vestiture frequently more conspicuous and always uneven; body usually more or less rufo-piceous in color and noticeably depressed.....

Antennal club generally narrower, densely pubescent throughout, the basal joint much shorter; body always intense black throughout, except in the next subdivision, occasionally somewhat depressed.

Body oblong, moderately convex, densely, confusedly punctate and densely but unevenly clothed throughout with oval whitish scales; beak as in the preceding section; antennal club strongly annulate, the basal joint



- constituting scarcely more than one-third of the mass; anterior coxæ widely separated, the prosternum flat, not armed in the male .....**II**
- Body more or less oblong-oval, subglabrous, the beak extremely slender, sometimes nearly straight, tumid above at base, the transverse constriction distinct; prosternum generally armed or otherwise modified before the coxæ in the male; second funicular joint short.....**III**
- Body narrow and linear, subglabrous; beak very slender, not tumid at base; prosternum armed in the male, the processes sometimes extremely developed; second funicular joint short; anterior coxæ rather narrowly separated .....**IV**
- Body moderately dilated, convex, subglabrous except in *longula*; beak thicker, not at all tumid at base, the transverse impression completely obsolete, represented by a frontal fovea; prosternum never armed in the male; anterior coxæ rather narrowly separated; second funicular joint long .....**V**

The species may be distinguished as follows:—

Subgenus I.

Elytral intervals each with a single series of punctures, the third not more conspicuously squamose behind the middle.

Pronotum bordered at the sides with an abruptly defined vitta of pale scales.

Vitta broad, composed of very large, broad and close-set scales; pronotal punctures coarse.

Prothorax distinctly wider than long, strongly constricted at apex; anterior coxæ separated by one-half of their own width; body stout.

**1 braccata**

Prothorax almost as long as wide, more feebly constricted near the apex, almost evenly but still more coarsely punctate; anterior coxæ separated by nearly their own width; body elongate-oval...**2 limbifer**

Vitta narrow but conspicuous, composed of slender, elongate but large and rather close-set scales, which are easily removable; pronotal punctures fine.....**3 blandita**

Vitta broad but very faint, composed of small, narrow and remotely distant scales; body much narrower and more depressed.....**4 tabida**

Pronotum without an abrupt marginal vitta, the vestiture, however, often gradually a little more distinct toward the sides.

Elytral grooves coarse, always more than one-half as wide as the intervals, the punctures of the latter coarse.

Form depressed, the pronotum parallel, nearly as long as wide, rounded and narrowed anteriorly .....**5 deplanata**

Form rather convex, the pronotum much wider than long, narrowed through apical half.....**6 punctiger**

Elytral grooves generally finer, or with the intervals more finely punctate.

Pronotal punctures fine, very remote, unevenly distributed and irregular in size; body rather dark rufo-testaceous throughout.

**7 denudata**

Pronotal punctures much closer and more evenly distributed.

Legs red; elytra rufo-testaceous; interstitial punctures of the elytra minute and distant, the setæ very minute.....8 **planiuscula**

Legs black or piceous-black; entire body black, the elytra occasionally feebly picescent; at least in *nasuta*.

Elytral intervals flat, the punctures small and rather distant; setæ somewhat long and distinct but sparse.....9 **nasuta**

Elytral intervals somewhat concave, the punctures small and very close-set; setæ minute and scarcely observable; body narrower, more oval and less oblong-parallel.....10 **oblita**

Elytral intervals with the punctures deep, distinct and broadly confused throughout, the third more conspicuously squamose in a short line behind the middle .....11 **seclusa**

#### Subgenus II.

Oblong-oval, moderately convex, piceous, the elytra and legs rufous, the former blackish along the suture; apex of the pygidium exposed....12 **grisea**

#### Subgenus III.

Punctures of the elytra confused, at least on the broader intervals.

Beak in both sexes shorter than the prothorax; form rather depressed; lustre dull .....13 **confusa**

Beak in the female very much longer, but apparently somewhat variable in length; body much more convex, sparsely punctate and more shining.

14 **ebena**

Punctures of the elytra forming an even single series on each interval.

Punctures of the intervals finer and remote.

Elytral setæ very minute and inconspicuous.

Male with two short, acute, ante-coxal processes and a large, rounded, extremely deep median excavation .....15 **puteifer**

Male without ante-coxal horns, but with a broad obtuse cusp before each coxa; prosternum just visibly and broadly impressed.

16 **confinis**

Male unarmed, the prosternum very feebly, broadly impressed and with a short obtuse ridge, extending for a short distance in advance of each coxal cavity .....17 **concurrens**

Elytral setæ long, white and conspicuous although remote; male without trace of ante-coxal processes, the prosternum flat.....18 **concinna**

Punctures of the intervals strong, deep and close-set.

Small species, the elytral setæ very minute and inconspicuous.

19 **fratercula**

Larger species, more elongate; elytral setæ longer, distinct but not very conspicuous; pronotal punctures finer and sparser...20 **semitens**

#### Subgenus IV.

Legs black; beak in the female generally not longer than the prothorax.

21 **prolixa**

Legs pale and bright rufous throughout, more elongate; body more polished and with a distinct æneous lustre, the elytral striæ still finer; beak in the female longer .....22 **nitidissima**

#### Subgenus V.

Anterior coxæ separated by fully three-fourths of their own width; vestiture of the upper surface rather sparse but conspicuous, even, consisting of long white squamules; prothorax evenly narrowed almost from base to apex, the subapical constriction very broad and feeble.....23 **longula**

Anterior coxæ separated by not more than one-half of their own width; vestiture of the upper surface inconspicuous; prothorax rather pronouncedly subtubulate.

Pronotal punctures rather sparse shallow and variolate...24 **rectirostris**

Pronotal punctures very deep and much denser; anterior coxæ separated by scarcely more than one-fourth of their own width.....25 **calva**

#### I.

1 **Limnobaris bradata** n. sp.—Robust and rather strongly convex, oblong-oval, shining, piceous-black, the beak and antennæ rufo-piceous; legs paler, rufous; vestiture uneven, sparse, whitish, consisting of broad close-set scales in a marginal pronotal vitta and at the base of the third and fifth elytral intervals, also distinct on the scutellar lobe of the prothorax, elsewhere slender sparse and inconspicuous but mingled with a few more conspicuous scales on the seventh interval, sparse and uneven throughout beneath. *Head* sparsely and obsoletely punctulate, the transverse impression distinct; beak rather slender, evenly, distinctly arcuate, cylindrical, fully as long as the prothorax in the male, finely, sparsely, linearly punctate, more coarsely and irregularly so at the sides toward base; antennæ inserted distinctly beyond the middle, the basal joint of the funicle as long as the next three, second one-half as long as the first, outer joints a little thicker, club well developed, the basal joint forming more than one-half of the mass, shining and sparsely pubescent. *Prothorax* one-third wider than long, the sides feebly convergent and slightly arcuate to apical third, then rounded to the deep subapical constriction, the apex strongly, conically tubulate, one-half as wide as the base, the latter transverse, moderately lobed in the middle; disk rather coarsely but not densely and irregularly punctate, with two large discal spots and a broad flat median line impunctate. *Scutellum* small, glabrous, trapezoidal. *Elytra* but slightly wider and one-half longer than the prothorax, as wide as long, hemi-elliptical; striæ coarse, deep, not crenulate toward base; intervals one-half wider than the grooves, flat, uniseriately but unevenly and rather coarsely punctate. *Abdomen* coarsely densely and somewhat rugosely punctate. Prosternum separating the rather large anterior coxæ by not more than one-half of their own width. Length 3.1 mm.; width 1.6 mm.

Missouri (St. Louis). Mr. Schuster.

This isolated species is readily distinguishable by its stout convex form, the two impunctate areas of the pronotum and many other

characters. It is represented by a single male, having the abdomen unusually deeply impressed in the middle near the base, the impression hirsute with thickened suberect hairs. The apex of the pygidium is quite distinctly exposed.

**2 *Limnobaris limbifer* n. sp.**—Oval, moderately convex, polished, piceous-black, the antennæ hardly paler, the beak and legs rufous; vestiture very uneven, nearly white, consisting of large broad and rather dense scales in a broad marginal region of the pronotum and with scales of various sizes very remotely scattered over the remainder of the disk, especially evident on the basal lobe; on the elytra the scales are of varying sizes and scattered remotely along the intervals in nearly single lines, with a more distinct spot at the base of the third interval; on the under surface they are also of different sizes, rather sparse but dense toward the apex of the met-episterna. *Head* extremely minutely feebly and sparsely punctate, the transverse impression feeble but distinct, the beak cylindrical, rather stout, feebly flattened toward apex, polished, smooth but sparsely and sublinearly punctate at the sides toward base, evenly, rather strongly arcuate and about as long as the head and prothorax; antennæ inserted distinctly beyond the middle, slender, the first funicular joint as long as the next three, the second one-half as long as the first and one-half longer than the third, the club abrupt, small, with the basal joint composing nearly two-thirds of the mass, pubescent toward apex but gradually nearly glabrous and polished toward base. *Prothorax* very nearly as long as wide, the sides parallel and feebly arcuate to apical fourth, then rounded convergent and quite distinctly constricted to the apex, which is rather more than one-half as wide as the base, the latter transverse, the median lobe small, slightly prominent, the mes-epimera strongly visible from above; disk very coarsely punctured, the punctures deep, somewhat uneven and generally separated by nearly their own widths; impunctate line rather wide and conspicuous. *Scutellum* quadrate, flat, polished and glabrous. *Elytra* a little wider and about three-fourths longer than the prothorax, hemi-elliptical, acutely rounded behind, the humeri feebly tumid; disk rather coarsely, deeply striate, the intervals flat, one-half wider than the grooves, each with a single series of rather small but deep, distinct, rather remote punctures. Under surface coarsely but not very densely punctured; prosternum flat, separating the large coxæ by not quite their own width, the sub-apical constriction distinct and coarse. Length 3.6 mm.; width 1.5 mm.

Florida.

The single type is apparently a female. This species belongs in the neighborhood of *punctiger*, but is not at all closely allied to it. I have before me a specimen from Colorado which is possibly conspecific; it has the interstitial punctures coarser, the squamose border narrower and the elytra rufescent.

**3 *Limnobaris blandita* n. sp.**—Oblong-oval, rather depressed above, strongly shining, black, the elytra and legs more or less rufous; vestiture



yellowish-white, very uneven, consisting of larger and smaller squamules which are always long and slender, only distinct on the pronotum in a narrow rather abrupt and dense marginal vitta, on the elytral intervals very remotely dispersed in single series, with a distinct spot at the base of the third; beneath, the squamules are very fine and sparse throughout, except on the met-episterna where they are coarser and dense, becoming sparser posteriorly. *Head* minutely but only moderately sparsely punctate, the impression feeble but distinct and broadly angulate in profile; beak cylindrical, rather slender, subequal throughout, evenly, distinctly arcuate, scarcely as long as the prothorax in the male, a little longer than the latter but not sensibly more slender in the female, finely, lineately punctate, the punctures denser and confused at the sides toward base; antennæ inserted well beyond the middle in both sexes, the first funicular joint as long as the next three, the second scarcely one-half as long as the first and one-half longer than the third, club moderate, strongly annulate in apical half, the basal joint constituting one-half the mass, obconical, densely pubescent, only just visibly less densely so very near the base. *Prothorax* scarcely one-fifth wider than long, shaped nearly as in *limbifer*, although a little less convex, the punctures fine but deep, somewhat sparsely distributed, the median line narrow but evident. Scutellum small, quadrate, glabrous and shining. *Elytra* but very slightly wider than the prothorax and barely two-thirds longer, hemi-elliptical, rather obtusely rounded behind, the humeral callus almost obsolete; disk deeply but not coarsely striate, the grooves distinctly crenulate toward base; intervals twice as wide as the grooves, each with a single series of small, rather feeble and irregular, not very close-set punctures. *Abdomen* rather finely, not densely punctate. Prosternum flat, the anterior constriction moderate, not crossing the middle parts but represented there by a series of three or four punctures; anterior coxæ rather small, remote, separated by a little more than their own width. Length 3.2 mm.; width 1.3 mm.

Texas (Austin).

Somewhat allied to *limbifer*, but differing greatly in its more depressed form and much finer sculpture, the scales at the sides of the pronotum are not broad as in the species mentioned, and form a border which is only one-half as wide. Two specimens.

4 ***Limnobaris tabida*** n. sp.—Oblong-oval, subparallel, narrow and rather strongly depressed, somewhat shining, piceous-black, the legs and antennæ slightly rufescent; integuments subglabrous, very sparsely clothed with long and conspicuous yellowish-white setæ, slightly more robust and distinct but still sparse in lateral fifth of the pronotum, very sparse throughout beneath. *Head* glabrous, minutely, very sparsely punctate, the transverse impression deep and distinct; beak rather stout, evenly, somewhat feebly arcuate, almost equal in diameter throughout, coarsely, densely, rugosely punctate, with some coarse bristling squamules at the base, about equal in length to the prothorax; antennæ inserted at apical third, scape long, first funicular joint as long as the next three, second one-half longer than the third,

club moderate, sparsely pubescent and shining toward base. *Prothorax* very nearly as long as wide, the sides parallel and broadly arcuate to apical fifth, then more strongly rounded, thence strongly convergent and distinctly sinuate to the apex, which is about three-fifths as wide as the base, the latter transverse and very broadly, evenly and feebly bisinuate, the median lobe not prominent; disk rather coarsely, not very densely, unevenly punctate, the impunctate line visible behind the middle, the punctures unequal in size, unevenly distributed and often slightly elongate. Scutellum very small, wider than long. *Elytra* but slightly wider than the prothorax and three-fifths longer, the sides rather strongly convergent and broadly feebly arcuate, the apex evenly, not broadly rounded; humeri not prominent; striæ very coarse, deep; intervals just noticeably wider than the grooves, each with a single series of coarse, deep, close-set punctures, uneven in size, often slightly elongate and frequently anastomosing. *Abdomen* strongly but not very coarsely or densely punctate. Prosternum flat, separating the coxæ by a little more than their own width. Length 2.8 mm.; width 1.15 mm.

#### Illinois.

The single specimen appears to be a male, and the species somewhat resembles *deplanata*, differing in its distinctly narrower form, much smaller pronotal punctures and longer, more conspicuous dorsal vestiture, as well as the characters given in the table.

5 ***Limnobaris deplanata*** n. sp.—Oblong, depressed above, moderately shining, brownish-black throughout, subglabrous, the squamules small narrow and very sparsely, almost uniformly distributed above and beneath. *Head* minutely punctate anteriorly, alutaceous and impunctate in basal half, the transverse impression strong, broadly angulate in profile; beak with a few bristling squamules at base, rather slender, cylindrical, evenly, somewhat feebly arcuate, coarsely lineato-punctate, more densely so at the sides toward base, equal in length to the prothorax, the antennæ inserted distinctly beyond the middle, the basal joint of the funicle subequal to the next three, second one-half as long as the first, not quite equal to the next two, club abrupt, rather robust, scarcely as long as the preceding five joints combined, densely pubescent, the basal joint constituting a little more than one-half the mass and more sparsely pubescent very near the base. *Prothorax* almost as long as wide, the sides broadly, evenly arcuate and convergent anteriorly, becoming straight and parallel in basal half, subapical constriction feeble; apex one-half as wide as the base, the median lobe of the latter broadly rounded and feeble; disk coarsely, deeply, somewhat unevenly punctate, the punctures slightly elongate-oval and distinctly separated; impunctate line incomplete. Scutellum small, glabrous, subquadrate, widest behind. *Elytra* but very slightly wider than the prothorax and three-fourths longer, hemi-elliptical, the apex narrowly subtruncate; humeri not prominent; disk rather coarsely deeply evenly and abruptly striate, the intervals narrow, scarcely one-half wider than the grooves, each with a single series of coarse, deep, not very close-set punctures, the line of the series slightly impressed. *Abdomen* rather

coarsely, moderately closely punctate. Prosternum flat, evenly, feebly constricted but not foveate behind the apex, separating the coxæ by very slightly more than their own width. Length 3.0 mm.; width 1.25 mm.

Iowa (Keokuk).

The single specimen, apparently a male, represents a species entirely distinct from any other here described in its more depressed form and coarse sculpture, and especially in the distinctly concave elytral intervals. From *tabida*, which it more closely resembles, it may be known by the shorter, less conspicuous vestiture, more slender beak and very much coarser sculpture of the pronotum. There are, judging by material which has been recently sent me, apparently a number of species in our Central States allied to *deplanata* and *tabida*, and their separation will prove to be a problem of some difficulty.

6 ***Limnobaris punctiger*** Lec.—Proc. Am. Phil. Soc., XV, p. 314 (Centrinus).

Oval, rather narrow, piceous, the legs, beak and antennæ paler, rufous; vestiture beneath consisting of fine sparse squamules, almost absent above, but each puncture of the elytral series apparently with a long slender whitish scale. Beak slender, equal throughout, cylindrical, evenly, moderately arcuate, nearly as long as the head and prothorax, smooth, finely, linearly punctate at the sides toward base, the antennæ inserted a little beyond the middle, the scape long, extending almost to the eyes, the first funicular joint as long as the next three, the second fully one-half as long as the first and nearly as long as the next two, the club rather small but abrupt, the basal joint constituting a little more than one-half the mass, somewhat obconical, sparsely pubescent and slightly shining. Prothorax one-third wider than long, the sides parallel and feebly arcuate to just beyond the middle, then broadly rounded and convergent to the apex, the latter one-half as wide as the base, the apical constriction very small and feeble; punctures coarse, somewhat irregular in form, not very dense; mes-epimera strongly exposed from above. Scutellum small, quadrate. Elytra distinctly wider than the prothorax and more than twice as long, hemi-elliptical, the apex rather narrowly rounded, the humeri feebly tumid; striæ deep, abrupt, remotely punctate along the bottom, the intervals flat, equal, one-half wider than the grooves, each with a series of relatively coarse deep rounded and somewhat remote punctures. Prosternum flat but with a very strong transverse subapical constriction, the coxæ

separated by their own width. Abdomen coarsely punctured, the last two sutures gradually very wide toward the middle as usual. Length 3.2 mm.; width 1.3 mm.

Texas. Cab. LeConte. Represented by the unique type, which is in a rather poor state of preservation, being much rubbed; it is apparent, however, from broken fragments, that the elytral scales are normally quite distinct, and that there are some scattered scales toward the sides of the pronotum.

**7 *Limnobaris denudata* n. sp.**—Oval, rather depressed, rufo-piceous throughout, the integuments shining, the vestiture consisting of very small sparse and yellowish squamules, only evident toward the sides of the pronotum and elytra, and, on the latter, especially near the apex; on the under surface they are only distinct toward the abdominal apex. *Head* minutely, very remotely punctate, the impression strong, the beak rather stout, cylindrical, evenly, distinctly arcuate, not quite as long as the prothorax, minutely, linearly punctate, more coarsely densely and rugosely so at the sides very near the base; antennæ inserted well beyond the middle, the first funicular joint as long as the next three, the second but slightly more than one-half as long as the first and about as long as the next two, outer joints gradually robust and almost continuous in outline with the club, which is very small, oval, scarcely longer than the preceding three joints together, densely pubescent throughout, and with the basal joint fully one-half the mass. *Prothorax* but slightly wider than long, the sides parallel, evenly and distinctly arcuate, gradually convergent from apical third, feebly constricted behind the apex, which is fully three-fifths as wide as the base, the latter transverse, broadly bisinuate; disk with a rather broad impunctate line, narrow or obsolete toward apex, the punctures small but uneven in size and generally very sparse, much smaller near the median line. *Scutellum* small, subquadrate, glabrous. *Elytra* subequal in width to the prothorax and barely three-fourths longer, the sides feebly convergent and slightly arcuate, the apex abruptly, somewhat narrowly but obtusely rounded; humeri very feebly tumid; disk rather coarsely but only moderately deeply striate, the intervals flat, nearly twice as wide as the grooves, each with a single series of punctures which vary greatly in size, but generally deep, somewhat coarse, especially toward base and moderately approximate. *Abdomen* with the first suture evident and strongly arcuate toward the middle, the first two segments moderately strongly, not densely punctured, narrowly and feebly impressed along the middle. *Prosternum* flat, coarsely punctate, separating the coxæ by distinctly more than their own width. Length 3.3 mm.; width 1.3 mm.

#### Florida.

This species is not at all closely related to any other; it is represented by a single male. The sixth funicular joint is longer than either the fifth or seventh, and the club is unusually small.



8 **Limnobaris planiuscula** n. sp.—Oval, rather strongly depressed, polished, black, the elytra, legs and beak more or less rufous, the first somewhat clouded with piceous toward the scutellum; vestiture throughout above and beneath consisting of very small, remote and entirely inconspicuous setæ. *Head* minutely, sparsely punctate, the transverse impression strong; beak slender, cylindrical, equal throughout, evenly, rather feebly arcuate and not longer than the prothorax, smooth, minutely, sublineately punctured, more coarsely and confusedly so at the sides toward base; antennæ inserted just beyond the middle, the first funicular joint rather robust, as long as the next three, second but slightly longer than wide, a little longer than the third and scarcely more than one-third as long as the first, club moderate. *Prothorax* about as long as wide; sides parallel and feebly arcuate to apical fourth, then broadly rounded, convergent and somewhat broadly and feebly constricted to the apex, which is rather more than one-half as wide as the base, the latter transverse, the lobe small and feeble, rounded; disk rather coarsely, deeply, somewhat unevenly and closely punctate, the punctures always distinctly separated, the impunctate line narrow but evident. *Scutellum* small, flat, glabrous, anteriorly parabolic, wider behind, the hind margin broadly, evenly arcuate. *Elytra* but just visibly wider than the prothorax and three-fourths longer, hemi-elliptical, rather acutely rounded at apex, the humeri not prominent; disk with moderately deep striæ, the intervals flat, scarcely more than one-half wider than the grooves, each with a single series of fine but deep, irregular and unevenly but generally remotely spaced punctures. *Abdomen* shining, the first suture entirely obliterated except near the sides, the first two segments finely, very remotely punctured, the last three rather coarsely and much more closely so. *Prosternum* flat, the coxæ remote, separated by a little more than their own width, the subapical constriction distinct. Length 2.9 mm.; width 1.0 mm.

Texas.

The single specimen appears to be a female, the basal parts of the abdomen being entirely unmodified, but as the male impression is generally very slight indeed in this genus, it is not possible to be entirely certain of the sex, especially in consideration of the short beak.

9 **Limnobaris nasuta** Lec.—Proc. Ac. Nat. Sci., Phila., 1859, p. 79 (Baridius).

Oval, depressed above, strongly shining, black, the vestiture consisting of small and very sparse setæ. Beak slender, cylindrical, evenly, feebly arcuate, as long as the prothorax in the male and one-fourth longer in the female, smooth, polished, finely, sublinearly punctate, more closely so at the sides; antennæ inserted distinctly beyond the middle, the first funicular joint almost as long as the next four, the second more than twice as long as wide but not quite

as long as the next two; club rather small but abrupt, densely pubescent throughout, and with the basal joint constituting a little more than one-half the mass. Prothorax about as long as wide, the sides parallel and broadly, evenly arcuate to near apical fifth, then convergent and distinctly constricted to the apex, which is scarcely more than one-half as wide as the base; disk rather finely but deeply, somewhat unevenly and not very densely punctate, the median line narrow. Scutellum small, glabrous, quadrate, the posterior angles rather prominent. Elytra slightly wider and four-fifths longer than the prothorax, hemi-elliptical, evenly, rather narrowly but not acutely rounded behind, the humeri feeble; disk with rather coarse but moderately deep striæ, the intervals nearly twice as wide as the grooves, flat, each with a single series of generally small but deep, not very close-set punctures, which vary greatly in size, more or less broadly confused toward the base of the third. Abdomen polished, rather finely, not very densely punctured. Prosternum flat, separating the coxæ by more than their own width, the punctures not conspicuously coarse. Length 3.7-4.4 mm.; width 1.35-1.75 mm.

California (San Francisco) and Texas (El Paso). Numerous specimens. The male does not differ from the female by any structural peculiarities of note.

10 **Limnobaris oblita** n. sp.—Elongate-oval, moderately convex, strongly shining, the elytra minutely granulato-reticulate and slightly alutaceous, black throughout, the legs and antennæ with a piceous tinge, subglabrous, the vestiture excessively sparse throughout, the setæ very small and inconspicuous. *Head* minutely but strongly, sparsely punctate, the impression quite distinct; beak slender, cylindrical, evenly, rather feebly arcuate, shining, finely, linearly and not very densely punctate, with two or three bristling squamules at the upper border of the eyes, about as long as the head and prothorax; antennæ inserted just beyond the middle, the basal joint of the funicle nearly as long as the next four, second barely one-half longer than the third, club oval, nearly as long as the five preceding joints combined, the basal joint composing three-fifths of the mass and sparsely pubescent toward base. *Prothorax* slightly wider than long, the sides just visibly convergent, evenly and feebly arcuate from the base to the constriction, the latter rather deep and abrupt and situated at a somewhat unusually great distance behind the apex, the latter broadly sinuate in the middle, one-half as wide as the base, which is transverse and almost perfectly straight throughout; disk not very coarsely but deeply, somewhat closely punctate, the punctures rather unevenly distributed, a median line not extending to the apex and a wide apical margin entirely impunctate. Scutellum small, flat, polished, triangular, widest and truncate behind. *Elytra* quite distinctly

wider than the prothorax and nearly twice as long, the sides parallel and very feebly arcuate in basal two-thirds, then gradually convergent, the apex rather narrowly rounded; humeral callus small and but slightly prominent; disk deeply, abruptly, moderately coarsely striate, the intervals flat or feebly concave, from one-half to once wider than the grooves, each with a single series of small, not very deep, close-set and uneven punctures. *Abdomen* strongly but not densely punctate. *Prosternum* flat, with a fine transverse impressed line behind the apex, the latter feebly sinuate in the middle; *coxæ* rather large, separated by fully three-fourths of their own width. Length 3.5 mm.; width 1.4 mm.

#### Wisconsin.

This species is not closely allied to any other and appears to form one of the transitions from the species with stout beaks and remote anterior *coxæ*, to those with very slender straight beaks and more narrowly separated *coxæ*. The unique specimen is a female.

11 ***Limnobaris seclusa*** n. sp.—Oval, moderately stout, rather feebly, evenly convex above, shining, piceous, the legs rufous; vestiture very uneven, consisting, on the pronotum, of large broad and pale scales toward the sides and before the scutellum, the scales becoming narrower and posteriorly oblique anteriorly and toward the middle, elsewhere dark in color, smaller and inconspicuous; on the elytra the large pale scales form a short line on the third interval behind the middle, and several small spots along the base, elsewhere narrow, elongate, darker and of different sizes from very minute setæ to conspicuous scales; on the under surface they are elongate and rather sparse throughout. *Head* almost completely impunctate but minutely granuloreticulate, the impression distinct; beak cylindrical, rather stout toward base, evenly, feebly arcuate, with bristling scales just before the eyes, a little longer than the head and prothorax in the female, but not quite as long as the prothorax in the male, rather coarsely, sublinearly punctate; antennæ inserted at the middle in the female or distinctly beyond in the male, the basal joint of the funicle as long as the next three, second but slightly longer than the third, club moderate, the basal joint forming much more than one-half the mass, densely pubescent but gradually more sparsely so and slightly shining toward base. *Prothorax* nearly as long as wide, the sides parallel and scarcely arcuate to apical third, then broadly rounded and convergent to the apex, which is about one-half as wide as the base; apical constriction almost obsolete; base transverse, broadly bisinuate; disk with a wide entire and conspicuous polished impunctate line, the punctures coarse and dense. *Scutellum* small, glabrous, a little longer than wide. *Elytra* slightly wider and about one-half longer than the prothorax, evenly hemi-elliptical, the humeral callus feeble; disk with rather fine, moderately deep, finely, conspicuously and remotely punctured striæ, the intervals flat, fully twice as wide as the grooves, finely, confusedly, very deeply but not densely punctate throughout. *Prosternum* flat, separating the *coxæ* by much more than their own width. Length 2.5–3.2 mm.; width 1.1–1.4 mm.

Arizona; Southern California.

The general characters of the above description are drawn from the female; in the single very small male before me, the prothorax is quite distinctly wider than long, with the apex three-fifths as wide as the base. The great disparity in the length of the beak is, however, the only very prominent sexual difference. In certain general characters of sculpture and vestiture, *seclusa* makes an excellent transition from the normal forms of this subgenus to *grisea*.

## II.

12 ***Limnobaris grisea*** Lec.—Proc. Am. Phil. Soc., XV, p. 312 (Centrinus).

Oblong-oval, moderately convex, piceous-black, the elytra and legs rufous; vestiture consisting of large elongate-oval yellowish-white scales, not contiguous beneath except in anterior two-thirds of the met-episterna; on the pronotum they are still more elongate, denser near the sides and finest and sparsest at lateral fourth; on the elytra they are broadly oval and unevenly disposed in strongly marked lines along the intervals, the line of the third interval being especially wide and conspicuous. Head glabrous, minutely, sparsely and feebly punctate, the impression very feeble; beak cylindrical, rather stout, evenly and rather strongly arcuate, as long as the head and prothorax in the female, but only as long as the latter in the male, the basal joint of the funicle as long as the next four together, the second as long as the next two, outer joints very short and transverse; club in the male large, densely pubescent, as long as the six preceding joints together, oval, pointed, the rings decreasing abruptly in transverse diameter, the basal joint much less than one-half the mass. Prothorax coarsely, closely punctate, two-thirds wider than long, the sides subparallel in basal two-thirds, then strongly rounded and rapidly convergent but not distinctly constricted to the apex, basal angles obtuse, the mesepimera strongly exposed from above. Scutellum rather large, quadrate, glabrous, but indented and setose at each side. Elytra a little wider than the prothorax and about twice as long, hemi-elliptical in outline, the striae fine, the intervals strongly, confusedly punctate and from two to more than three times as wide as the grooves. Length 3.4 mm.; width 1.65 mm.

The three specimens before me are from Arizona and New Jersey; it was originally described from Texas. In the female the antennal



club is notably smaller than in the male, and the funicle is longer and more slender, but aside from the shorter beak of the male I do not observe any other sexual differences.

### III.

13 **Limnobaris confusa** Boh.—Sch. Curc., III, p. 740 (Centrinus).

Oblong-oval, subdepressed, alutaceous, black throughout, the antennæ slightly paler; integuments subglabrous, the vestiture consisting of very small fine white squamules, sparsely disposed above and beneath. Beak in the male rather stout, cylindrical, finely, densely punctured and squamulose toward base, straight in basal two-thirds, then bent, scarcely more than three-fourths as long as the prothorax, the antennæ inserted distinctly beyond the middle, the basal joint of the funicle robust, not as long as the next three, the second small, obconical, one-half longer than wide, the club moderately stout, oval, densely pubescent and nearly as long as the preceding five joints combined. Prothorax slightly wider than long, sides parallel and feebly arcuate, rounded convergent and constricted toward apex, the latter one-half as wide as the base; punctures fine, not very close-set, the impunctate line distinct. Elytra a little wider and three-fourths longer than the prothorax, hemi-elliptical, the humeral callus large but feeble; striæ fine, the intervals flat, wide, finely and more or less confusedly punctate. Prosternum separating the coxæ by two-thirds of their own width or less, with two slender slightly contorted ante-coxal spiniform processes, which are very oblique, and immediately before which there is a large deep excavation. In the female the beak is more slender, more evenly and distinctly arcuate, smooth, polished and evidently punctured only near the base, not longer than in the male, being about three-fourths as long as the prothorax; the prosternum is flat and the intercoxal process is not noticeably wider than in the male. Length 2.7–3.5 mm.; width 1.1–1.5 mm.

In the description of Boheman, the beak is said to be as long as the prothorax in the italicized diagnosis, but as long as the head and prothorax in the description which follows, the fact being, if I have correctly identified the species, that it is much shorter than the prothorax in both sexes. In the description referred to I cannot comprehend the allusion to a "pygidium."

The material before me includes series from Florida, North

Carolina, New York, Indiana, Nebraska and Colorado, some being smaller, others larger, some with the male prosternal spines short, others so long as to nearly attain the anterior margin. The want of any accurate definition of the species deters me, however, from further investigation of these forms, although from the constantly small size and less developed ante-coxal processes of several good series, collected in definite localities, it is possible that two or three species or subspecies may be commingled. This species is said to occur in California (Mann. Bull. Mosc., 1843, 2d, 293), but I have not seen any specimens from that region.

14 **Limnobaris ebena** n. sp.—Oblong-oval, moderately convex, polished, black throughout; vestiture above and beneath consisting of small and very sparse slender white squamules, much less conspicuous than in *concinna*, but more so than in *confinis*, unevenly sublineate on the elytra. *Head* minutely, scarcely visibly punctate, the constriction feeble but distinct, caused by a slight gibbosity at the base of the beak, the latter very slender, evenly cylindrical, almost straight, much longer than the head and prothorax, shining, moderately punctured; antennæ inserted scarcely at all beyond the middle, slender throughout, the basal joint of the funicle as long as the next three, the second nearly two-thirds as long as the first and equal to the next two, the club very slender, fusiform, not abrupt, densely, coarsely pubescent and rather longer than the preceding four joints combined, the basal joint composing nearly one-half of the whole. *Prothorax* nearly one-third wider than long, the sides just visibly convergent from the base to the distinct apical constriction, and broadly, evenly arcuate; apex one-half as wide as the base, the latter transverse, the median lobe small and feeble; mes-epimera strongly exposed from above; disk rather finely, not deeply and somewhat sparsely punctate, the impunctate line distinct. Scutellum small, quadrate. *Elytra* oblong, one-third longer than wide, distinctly wider than the prothorax and fully twice as long, the sides parallel and nearly straight, slightly rounded at base to the prothorax and very broadly rounded in apical third; disk with deep, very even, abrupt grooves, the intervals from two to three times as wide as the striæ, finely feebly and sparsely punctate, the punctures forming rather even series on the second, fourth and sixth, but confused on the others. *Abdomen* finely, feebly and sparsely punctate. Prosternum broadly, feebly impressed, separating the coxæ by three-fourths of their own width, the transverse subapical impression even, distinct, with a small impressed pit adjoining it anteriorly. Length 3.8 mm.; width 1.65 mm.

#### Texas.

One female example. This species is allied to *confinis*, but is more robust, with a longer beak in the female, more widely separated anterior coxæ and more distinct squamules.

With the type I associate a male and female from Indiana, which

differ only in being a little less robust and less polished, with the beak in the female not longer than the head and prothorax, and, in the male, distinctly shorter than the latter, this sex having two long slender prosternal processes.

15 **Limnobaris puteifer** n. sp.—Oblong-oval, moderately convex, black, rather shining and subglabrous throughout, the vestiture consisting of very minute remote setiform squamules, more distinct beneath than above. *Head* minutely, sparsely punctured, deeply inserted, the transverse constriction very feeble; beak in male rather stout, evenly cylindrical, feebly arcuate, three-fourths as long as the prothorax, roughly, deeply punctured and sparsely squamulose; antennæ short, inserted beyond the middle, the basal joint of the funicle robust, not as long as the next three, the second one-half longer than wide and one-half longer than the third, outer joints gradually transverse and coarctate, club nearly as in *confinis*. *Prothorax* about one-third wider than long, the sides feebly convergent from the base and slightly arcuate, the apical constriction strong; apex a little more than one-half as wide as the base, the latter transverse; median lobe very small, feeble; disk alutaceous, rather finely sparsely and not deeply punctate, the impunctate line passing only slightly beyond the middle. *Scutellum* small, oblong. *Elytra* nearly one-third wider than the prothorax and two and one-half times as long, oblong, parallel, evenly rounded in apical third, the humeri scarcely prominent; disk rather finely, abruptly, evenly striate, the intervals flat, about three times as wide as the grooves, each with a single series of fine remote punctures. *Abdomen* rather closely punctured toward the sides, sparsely in the middle, the punctures fine. *Prosternum* with a large oval extremely deep excavation in the middle, and with a short straight acute and very oblique process before each coxa, the coxæ separated by two-thirds of their own width. Length 3.0 mm.; width 1.25 mm.

Indiana?

This species bears an extreme resemblance to *confinis*, being identical in sculpture and vestiture, but the ante-coxal processes are much more developed, the elytra relatively wider and longer, the second joint of the antennal funicle more elongate, and the prosternum differs radically in having a large extremely deep median excavation. A single male, without definite indication of locality, but in all probability from the region indicated.

16 **Limnobaris confinis** Lec.—Proc. Am. Phil. Soc., XV, p. 317 (Centrinus).

Oblong-oval, moderately convex, black throughout, shining, subglabrous, the vestiture consisting of very small sparse and subrecumbent setæ which, on the elytra, are arranged in single inconspicuous series. Beak in the male thick, cylindrical, nearly straight,

scarcely more than three-fourths as long as the prothorax, roughly punctured, dull, sparsely squamulose, the antennæ inserted distinctly beyond the middle, short, the basal joint of the funicle robust, not as long as the next three, the second a little longer than wide and slightly longer than the third, outer joints transverse; club densely pubescent, rather robust and fully as long as the preceding five joints together. Prothorax subconical, slightly wider than long, the sides evenly, feebly arcuate, the apical constriction distinct; apex three-fourths as wide as the base; punctures rather fine, shallow and sparse, the impunctate line distinct. Elytra oblong, parallel, obtusely rounded behind, distinctly wider than the prothorax and more than twice as long; striæ fine, abrupt; intervals fully three times as wide as the grooves, each with a single series of minute, extremely distant punctures. Prosternum broadly, very feebly impressed, with a feeble elevated cusp before each coxa, and a small foveiform pit just behind the apex, the coxæ separated by three fifths of their own width. Length 2.3–2.9 mm; width 0.9–1.2 mm.

The four specimens before me are from New York, Virginia, Iowa and Texas, the latter being the only female. In this sex the beak is very slender, cylindrical, nearly straight, as long as the head and prothorax, and the antennæ are longer and with a more slender club, but, as the elytral punctures are not by any means so distinct as in the northern specimens, it may not actually belong to this species.

17 **Limnobaris concurrens** n. sp.—Oblong-oval, distinctly convex, black, moderately shining and subglabrous throughout, the minute slender setiform squamules very sparse above and beneath, forming single series on the elytra. Head dull, minutely, sparsely punctate, the transverse impression fine and distinct, the basal portion of the beak feebly tumid above the eyes; beak in the male rather slender, cylindrical, coarsely, densely punctured at the sides, fully as long as the prothorax, straight in basal two-thirds, slightly arcuate thence to the apex; antennæ inserted well beyond the middle, the basal joint of the funicle robust, not as long as the next three, the second scarcely one-half as long as the first and a little longer than wide, club very narrow, elongate-oval, densely pubescent, as long as the five preceding joints combined. Prothorax but slightly wider than long, the sides feebly convergent and nearly straight to apical third, then broadly rounded, the apical constriction distinct; apex truncate, three-fifths as wide as the base, the latter broadly, feebly bisinuate, the lobe small and feeble; disk alutaceous, finely, not strongly, sparsely punctate, the impunctate line narrow but almost entire. Scutellum very small, subquadrate, glabrous. Elytra about one-third wider than the prothorax and a little more than twice as long, parallel, evenly rounded in



apical two-fifths; humeral callus not prominent; disk polished, rather finely, abruptly, evenly striate, the intervals flat, a little more than twice as wide as the grooves, each with a single series of fine, rather distant punctures. *Abdomen* feebly, not closely punctured. Prosternum broadly, very feebly impressed along the middle, with a small feeble subtransverse fovea behind the apex, the sides of the longitudinal impression slightly prominent in the form of a low obtuse ridge for a short distance before each coxa, but without trace of antecoxal cusp, the coxæ separated by slightly less than one-half of their own width. Length 2.2–3.2 mm.; width 0.85–1.4 mm.

District of Columbia. Mr. Jülich.

The above description is drawn from the male. In the female the beak is slightly more slender very feebly arcuate and as long as the head and prothorax, with the antennæ inserted at or just behind the middle. The antennæ are longer and more slender, the second funicular joint almost as long as the next two, and the prosternum is perfectly flat, separating the coxæ by fully three-fourths of their own width. *Concurrens* is allied to *confinis*, but differs in its much longer beak, especially in the male, and by its narrower antennal club. Numerous examples.

18 ***Limnobaris concinna*** Lec.—Proc. Am. Phil. Soc., XV, p. 316 (Centrinus).

Oblong-oval, decidedly convex, black throughout, moderately shining, smooth, the vestiture consisting above and beneath of long sparse narrow white but very distinct squamules, arranged in single lines on the elytral intervals. Beak not quite as long as the prothorax and slender in the female, distinctly shorter and thicker in the male, feebly arcuate, slightly gibbous at the basal constriction, which is fine but distinct, roughly punctured and dull in the male, a little smoother in the female, the antennæ very slightly ante-median in both sexes, short, stout, the first funicular joint as long as the next three, two to seven small, equal in length but increasing in width; club relatively large, fully as long as the preceding six joints, densely, rather coarsely pubescent, the basal joint composing nearly one-half the mass. Prothorax not quite as long as wide, parallel, distinctly constricted at apex, the latter about three-fourths as wide as the base; disk rather sparsely, strongly punctate. Scutellum very small, elongate-oval, glabrous. Elytra equal in width to the prothorax and three-fourths longer, parallel, rounded behind in apical third; striæ very fine; intervals minutely, uniseriately punctate and remotely transversely creased. Prosternum flat, sepa-

rating the coxæ by three-fifths of their width, the anterior constriction in the form of a transverse fold of the surface, immediately before which there are two small moderately distant punctiform foveæ. Male without trace of ante-coxal spines. Length 1.8–2.5 mm.; width 0.7–1.0 mm.

Florida (Enterprise and Baldwin) and Texas, also said by LeConte to occur in New York, but I have not recognized it from this locality.

19 **Limnobaris fratercula** n. sp.—Oval, feebly convex, deep black throughout, rather strongly shining, subglabrous, the fine squamules very small and sparse above and beneath. *Head* alutaceous, very minutely, sparsely punctate, the beak tumid at base, the transverse impression distinct; beak in the male rather stout, cylindrical, just visibly shorter than the prothorax, feebly arcuate, becoming straight in basal two-thirds, punctured at the sides, especially toward base, shining; antennæ slightly ante-medial, the first funicular joint stout, not longer than the next two, the second slightly longer than wide, outer joints broader, almost continuous in outline with the club, the latter densely pubescent, moderately stout, about as long as the preceding four joints together, the first one adjoining it being more pubescent than the others. *Prothorax* very nearly as long as wide, the sides feebly convergent and broadly arcuate from the base, the apical constriction almost obsolete; apex truncate, rather more than one-half as wide as the base; basal lobe small and very feeble; disk not coarsely but somewhat strongly, moderately sparsely punctured, the impunctate line distinct. Scutellum small, subquadrate. *Elytra* a little wider than the prothorax and fully twice as long, elongate-oval in form, the humeri but slightly prominent; disk rather finely striate, the striæ becoming coarser and feebly crenulate toward base; intervals flat, about twice as wide as the grooves, each with an almost even single series of rather coarse, deep and somewhat distant punctures. *Abdomen* polished, finely, not densely punctate. Prosternum flat, with a small, rather deep pit behind the apical margin; coxæ separated by barely one-half of their own width; ante-coxal processes completely obsolete, the surface even. Length 2.5 mm.; width 1.0 mm.

Florida.

The three specimens before me are males, the abdomen having a small elongate-oval and rather deep subbasal impression. The species is related to *confusa*, but differs in its small size, uniseriate elytral intervals, simple male prosternum and slightly longer beak. From *confinis* it differs in its broader, more depressed form, much coarser elytral striæ and larger, more close-set serial punctures.

20 **Limnobaris seminitens** n. sp.—Elongate-oval, feebly convex, moderately shining, minutely reticulate, the pronotum alutaceous, black, sub-

glabrous, the small fine squamules very sparse throughout. *Head* minutely, sparsely punctate, the transverse impression feeble; beak slender, feebly, evenly arcuate, evenly cylindrical, smooth, polished, finely, sparsely lineato-punctate, confusedly so near the base, equal in length to the prothorax, the antennæ inserted just behind the middle, slender, the first funicular joint fully as long as the next two, the second twice as long as wide and one-half longer than the third, club rather narrow, oval, as long as the preceding four joints combined. *Prothorax* nearly as long as wide, the sides nearly parallel and straight in basal two thirds, then gradually broadly, evenly arcuate and convergent to the apex, the subapical constriction feeble; apex truncate, distinctly more than one-half as wide as the base, the median lobe of the latter feebly rounded; disk finely, sparsely punctate, the impunctate line distinct. *Scutellum* small, subquadrate, slightly broader behind. *Elytra* but little wider than the prothorax, fully twice as long as the latter, parallel, evenly rounded in apical third; humeri scarcely at all prominent; disk with fine abrupt rather deep and even striæ, the intervals flat, fully three times as wide as the grooves, each with a single series of fine, feeble, rather distant punctures, confused toward the base of the third. *Abdomen* finely, sparsely punctured, but, as usual, densely so toward apex. *Prosternum* flat, with a small subapical pit, the coxæ separated by one-half of their own width. Length 3.5 mm.; width 1.4 mm.

#### Nebraska.

Not closely allied to any other species known to me, and represented by a single specimen which is undoubtedly the female, although the abdomen has a small feeble subbasal impression, and the fifth segment a small rounded indentation. A specimen in my cabinet from Florida also belongs apparently to this species, but is larger and with a much longer beak.

#### IV.

21 ***Limnobaris prolixa*** Lec.—Proc. Am. Phil. Soc., XV, p. 317 (Centrinus).

Slender, parallel, convex, shining, subglabrous, the dorsal setiform squamules very minute but longer and more visible toward the sides of the prothorax. Beak feebly, evenly arcuate, slender, cylindrical, as long as the prothorax in both sexes, a little thicker and much more densely punctate in the male, the transverse basal constriction almost obsolete; antennæ inserted at the middle in the male, or far behind this point in the female, the first funicular joint as long as the next three, second one-half longer than the third; club moderate, as long as the four preceding joints combined. *Prothorax* slightly but distinctly wider than long; the sides parallel,

feebly arcuate; subapical constriction small, distinct; apex nearly three-fourths as wide as the base, the disk finely, sparsely punctate and slightly alutaceous. Scutellum small, glabrous, quadrate. Elytra very slightly wider than the prothorax and nearly three times as long, parallel, obtusely rounded behind in apical fourth; humeral callus small but rather prominent; striæ very fine but deep; intervals wide, uniseriately, minutely and remotely punctate. Prosternum broadly but strongly impressed along the middle in the female; in the male it has a deep rounded pit near the middle, and, before each coxa, a slender process which is much more developed than in any other of our apygidiata Barini, projecting very nearly as far beyond the apical margin of the prosternum as the distance between the latter and the coxæ, the apices diverging horizontally toward apex in order not to interfere with lateral movements of the beak; coxæ separated by nearly one-third of their own width. Length 2.3–3.4 mm.; width 0.75–1.1 mm.

Illinois and Michigan. I also associate with this species a number of specimens taken by Mr. Wickham at Greeley, Colorado, which seem to be merely a little smaller in size; in the single male, however, the prosternal spines are very much shorter, only projecting as far as the anterior margin. I do not notice the bronzy lustre mentioned by LeConte.

22 **Limnobaris nitidissima** n. sp.—Very elongate, parallel, convex, highly polished, black with a rather strong æneous lustre; legs pale, bright rufo-testaceous; integuments subglabrous, the minute setæ very sparse above, slightly longer and more evident toward the sides of the pronotum, only distinct beneath on the met-episterna, where they are broader, somewhat dense and squamiform. *Head* very minutely, sparsely punctate, the impression almost obsolete, broadly subfoveate in the middle; beak very slender, straight in basal half, gradually feebly arcuate and rufescent thence to the apex, smooth, cylindrical, punctate at the sides toward base and fully as long as the head and prothorax; mandibles small, strongly arcuate, thick, deeply notched and unevenly bidentate at apex, and with two or three strong denticles externally toward base; antennæ inserted at basal two-fifths, slender, the scape just attaining the eye, basal joint of the funicle not quite as long as the next three, second one-half longer than the third, club moderate. *Prothorax* about as long as wide; sides straight and parallel fully to apical third, then broadly rounded, convergent and sinuate to the apex, which is two-thirds as wide as the base, the latter transverse, the median lobe extremely feeble; disk with a feebly defined, incomplete median line, the punctures minute and very sparse. Scutellum small, quadrate, glabrous. *Elytra* quite distinctly wider than the prothorax and two and three-fourths times as long, parallel, the



sides feebly convergent in apical third, the apex narrow but obtusely rounded; humeri slightly prominent; disk nearly as in *prolixa*, but with the punctures still more minute and feeble. Prosternum strongly impressed along the middle, separating the coxæ by fully one-third of their own width. Length 4.1 mm.; width 1.35 mm.

Texas (Galveston).

A single female. This species may be recognized at once by its polished æneous surface and red legs; it differs greatly from *prolixa* in the latter respect, and also in its longer beak.

## V.

23 ***Limnobaris longula*** Lec.—Proc. Am. Phil. Soc., XV, p. 316 (Centrinus).

Elongate-oval, convex, black, the tarsi and antennæ somewhat pale, shining, the vestiture white, consisting of long, slender, rather sparse but conspicuous squamules, almost evenly distributed above and beneath, becoming shorter and squamiform on the sternal parapleuræ. Head finely, sparsely punctate, the constriction obsolete, the frontal fovea very small and prolonged anteriorly for a short distance; beak in the female moderately slender, slightly thicker toward base, cylindrical, smooth, polished, evenly, moderately arcuate, about as long as the head and prothorax, almost impunctate but abruptly densely so and with erect squamules before the eyes; antennæ inserted a little behind the middle, the basal joint of the funicle not as long as the next three, the second scarcely two-thirds as long as the first and as long as the next two; club moderate, densely pubescent, not very slender. Prothorax two-fifths wider than long, the sides broadly, feebly arcuate, becoming convergent and gradually broadly and just visibly sinuate to the apex, parallel toward base, the apex nearly three-fifths as wide as the base; disk rather strongly, not very densely punctate, with a narrow impunctate line. Scutellum small, glabrous. Elytra scarcely at all wider than the prothorax and about twice as long, hemi-elliptical, the striæ not very coarse, with the edges finely, feebly, unevenly, subcrenulate, the intervals finely, sparsely, unevenly, punctured and transversely, unevenly rugulose. Prosternum strongly impressed along the middle, separating the anterior coxæ by fully three-fourths of their own width. Length 4.0–4.3 mm.; width 1.65–1.8 mm.

Texas and Florida. In the original type, from which the above description is taken, the abdomen has, near the base, a narrow

elongate and very feeble impression; it is however a female, as is conclusively shown by the polished, almost impunctate beak; the impression is spurious, and has very nearly misled me in several species of genera allied to this. There are but two examples known to me, and the Florida specimen in my cabinet is a male, a little larger than the Texas type, intense black throughout, the beak short, rather thick, cylindrical, densely, deeply lineato-punctate, evenly, feebly arcuate and distinctly shorter than the prothorax, the antennæ being inserted at apical two-fifths; otherwise the two specimens seem to agree very well indeed, except that the male is a little stouter and with less elongate elytra, rather the reverse of what might be expected.

24 ***Limnobaris rectirostris*** Lec.—Proc. Am. Phil. Soc., XV, p. 315 (Centrinus).

Elongate-oval, convex, black, polished, the pronotum slightly alutaceous, subglabrous, the vestiture consisting of minute slender white squamules, very sparse throughout. Beak in the male scarcely as long as the prothorax, thick, densely punctate, evenly cylindrical throughout, compressed and carinate above, the frontal constriction obsolete but represented by a large deep and transversely angulate fovea; antennæ inserted at the middle, the second funicular joint nearly as long as the first and as long as the next two; club moderately stout, elongate-oval, densely pubescent, as long as the four preceding joints combined, and with the basal joint constituting two-fifths of the mass. Prothorax not quite as long as wide, feebly subconical, the sides more strongly arcuate before the middle, the apex two-thirds as wide as the base; punctures rather uneven in distribution but generally not very close; median line distinct. Elytra but little wider than the prothorax and much more than twice as long, the striae fine, abrupt; intervals wide, finely, feebly, rather sparsely and transversely punctate, the punctures confused on the third, but more or less evenly uniseriate on the others. Prosternum broadly sinuate at apex, strongly, transversely constricted behind the apex, broadly, feebly impressed along the middle, separating the coxæ by one-half their own width. Length 4.2–4.7 mm.; width 1.7–1.9 mm.

Indiana and Illinois. In the female the beak is very slender, evenly but extremely feebly arcuate and fully one-half longer than the prothorax, the prosternum flat. In three of the four males

before me the beak is a little longer than the prothorax, with the frontal fovea much more feeble, the body more slender and the prosternum perfectly flat along the middle, but they are otherwise so similar to the form which I regard as typical, that I hesitate to describe them under a separate name.

25 **Limnobaris calva** Lec.—Proc. Am. Phil. Soc., XV, p. 314 (Centrinus).

Oblong, convex, moderately shining, the very small slender squamules sparse and inconspicuous above, but more distinct beneath, although still sparse. Head without trace of the feeblest transverse impression, but with a minute subobsolete median puncture, the beak in the male stout, shining but deeply, rugosely punctured, feebly compressed and subcarinate above, equal in length to the prothorax, straight, broadly bent near the middle and thence feebly flattened to the apex; antennæ inserted slightly beyond the middle, slender, the second funicular joint much longer than the next two; club slender, pointed, as long as the preceding four joints combined. Prothorax distinctly wider than long, the sides strongly, evenly rounded at apical third to the constriction, the apex tubulate and slightly wider than one-half the base; disk not very coarsely but deeply and somewhat densely punctate, the impunctate line narrow and not attaining the apex. Scutellum small, quadrate. Elytra two-fifths longer than wide, scarcely at all wider than the prothorax and barely twice as long, obtusely rounded behind; sides distinctly convergent throughout; disk finely striate, the intervals from two to three times as wide as the grooves, coarsely, confusedly, rugosely but not very densely punctured. Abdomen very closely punctured. Prosternum obsoletely impressed along the middle, separating the coxæ by barely more than one-fourth of their own width. Length 5.2 mm.; width 2.2 mm.

Pennsylvania, Georgia and Florida. The male has a small elongate-oval feeble impression near the base of the abdomen. In the original type the sides of the prothorax are parallel and almost perfectly straight nearly to apical third, but in other specimens they are slightly convergent and strongly arcuate; in the Pennsylvania male the legs are black and the interstitial punctures coarse, while in another example the legs are red and the punctures finer. The description is drawn from the type specimen.

**OLIGOLOCHUS** n. gen.

The single species referred to this genus, greatly resembles *Microcholus striatus* in its general features of form, sculpture and vestiture, although much smaller in point of size, and would have been referred to *Microcholus* were it not for the distinctly different structure of the mandibles, which are not large and prominent as in that genus, but very small, thick, strongly arcuate, notched at apex and broadly decussate when closed.

The principal generic characters have been given in the table, and those of minor importance are referred to in the description of the single species given below. *Oligolochus* does not resemble *Zygobaris* either in habitus or structure.

1 ***Oligolochus convexus*** Lec.—Proc. Am. Phil. Soc., XV, p. 422 (*Zygobaris*?).

Oval, moderately and evenly convex, polished, black, the legs rufous; vestiture very sparse and uneven, white, consisting of large scattered scales towards the sides of the pronotum and on the median line before the scutellum, also on the elytra toward the base of the third and fifth intervals and a few widely scattered on the disk toward the sides, the latter smaller and narrower; on the under surface sparse but more evident on the sternal parapleuræ; all other punctures of the upper surface bearing extremely minute setæ. Beak moderately slender, evenly, not very strongly arcuate, coarsely, sparsely, unevenly punctate at the sides, as long as the prothorax, feebly thickened toward base and slightly flattened toward apex, the basal impression extremely feeble; antennæ inserted a little beyond the middle, the scape almost attaining the eye, the first funicular joint longer than the next three, the second small, slightly longer than the third; club moderate, abrupt, oval, densely pubescent, as long as the preceding four joints, with the basal joint one-half of the whole. Prothorax one-third wider than long, the sides very feebly convergent and distinctly arcuate from the base to the well-marked subapical constriction, the apex not tubulate, three-fifths as wide as the base, the median lobe of the latter small and feeble; impunctate line entire; punctures coarse, not dense. Scutellum very small, quadrate, impressed behind, glabrous. Elytra but slightly longer than wide, a little wider than the prothorax and three-fourths longer, hemi-elliptical, the apex narrowly subtruncate;



humeri rather prominent; striae rather coarse, deep, abrupt, one-half to two times wider than the grooves, each with an uneven single series of small, not very close-set punctures, more confused on the third. Abdomen closely, rather coarsely punctate, the fifth segment not as long as the two preceding, the pygidium slightly exposed at tip in the male. Length 2.3 mm.; width 1.2 mm.

Florida (Enterprise). Cab. LeConte. Represented by the unique male type. The prosternum is flat, the subapical constriction fine, even and continuous entirely across the surface and not obsolete at the middle as stated by LeConte; the surface between the constriction and the apex being rather strongly reflexed over the basal part of the head, the author quoted quite pardonably mistook the groove for the apical margin. The anterior coxae are separated by distinctly less than one-half of their own width. The legs are more slender than in *Microcholus striatus*, but the tarsal claws are very nearly similar, thick and approximate, though divergent and free at base.

#### **IDIOSTETHUS** n. gen.

This genus, though related to *Stethobaris*, is conspicuously distinct in antennal and pectoral structure, as well as in the general nature of the sculpture and vestiture. The antennae have the second funicular joint elongate when compared with that of *Stethobaris*, and the club is generally smaller than in that genus; the club varies, however, quite remarkably in size and structure.

The prosternum is noticeably tumid, especially before the coxae, reminding us in this respect of *Orthoris*, and the narrow, deep but not abruptly defined median canaliculation is formed in much the same manner, as a depression between the ante-coxal prominences. The coxae are much more approximate than in *Stethobaris*, never being separated by more, and generally by less, than one-third of their own width. The pronotal sculpture is always in greater or less part longitudinally rugulose, and the vestiture consists of small sparse slender and recumbent setae and squamules, the latter, in one of the species, widely dispersed over the elytra; they are generally, but not always, more distinct toward the sides of the body beneath, occasionally becoming conspicuously dense.

In the short tubulate prothorax, structure of the beak, mandibles and transverse frontal impression, scutellum, legs and tarsi, *Idiostethus* closely resembles *Stethobaris*, but the body is more elongate-

oval, with less prominent and especially less post-basal humeri, and the small, slender tarsal claws are more widely divergent.

The four representatives here recognized may be easily identified from the following characters, the species being more isolated among themselves than in *Stethobaris*:—

Elytra without dispersed squamules, the antennal scape more abruptly clavate.

Antennæ with the first funicular joint not longer than the next three together; club smaller, with its basal joint constituting about one-half of the mass; vestiture not dense at the sides beneath.

Sculpture coarse, the pronotum with a narrow, impunctate and generally subcarinate line; interstitial punctures of the elytra coarse and deep; larger species.....1 **tubulatus**

Sculpture finer, the pronotum very finely, densely rugulose and without median line; interstitial punctures smaller, rather indefinite and feeble; much smaller species.....2 **subcalvus**

Antennæ with the first funicular joint as long as the next four; club larger, elongate, nearly as long as the preceding six joints combined and with its basal joint constituting but slightly more than one-third of the mass; vestiture extremely dense at the sides of the body beneath...3 **ellipsoideus**

Elytra with widely dispersed, longer, whiter but slender squamules; antennal scape gradually clavate.....4 **dispersus**

1 **Idiostethus tubulatus** Say—Curc., p. 20; Ed. Lec., I, p. 285 (Camptorhinus—Say, *Stethobaris*—Lec.).

Oval, rather robust, moderately convex, black, the antennæ, tibiæ and tarsi piceous; integuments polished, the vestiture very sparse, consisting of short, slender, subrecumbent setæ, generally more evident toward the sides of the prothorax, and in a single line along each elytral interval. Beak slender, strongly arcuate, about one-half longer than the prothorax, rather densely, strongly punctate; antennæ inserted a little beyond the middle, with the scape abruptly clavate, the second funicular joint not quite as long as the next two, the club moderate, elongate-oval, rather abrupt, nearly as long as the five preceding joints combined, and with the basal joint constituting almost one-half the mass. Prothorax nearly three-fourths wider than long, the sides rather strongly convergent and straight to apical third, then broadly rounded and convergent to the strongly constricted and tubulate apex; punctures coarse, deep, rather dense, more or less longitudinally confluent, and with a narrow subcarinate impunctate line. Scutellum small, slightly wider than long, broadly emarginate at apex. Elytra abruptly much wider than the prothorax and fully two and one-half times as long,

hemi-elliptical in outline, the striae coarse, deep, remotely and distinctly punctate, but not at all crenulate, the intervals rather narrow, flat, uniseriately and more or less strongly punctate. Prosternum broadly, strongly impressed, the impression short, disappearing before the coxæ, the edges not abruptly defined; anterior coxæ rather large, very narrowly separated. Length 3.0–4.0 mm.; width 1.6–2.0 mm.

New York, Pennsylvania, Indiana, Illinois and Florida, the latter locality perhaps doubtful. Nine specimens, exhibiting considerable variation, chiefly in regard to the magnitude and density of the punctures. In some specimens the thoracic sculpture is longitudinally and strongly rugulose.

2 **Idiostethus subcalvus** Lec.—Proc. Am. Phil. Soc., XVII, p. 622 (Zygobaris).

Oval, strongly convex, shining, black throughout, the antennæ, tibiæ and tarsi more or less piceous; pubescence very short and sparse, slightly denser and nearly uniformly distributed beneath, the elytra without dispersed squamules. Head finely, distinctly punctate, the beak very densely, rugulosely so, substriate along the fine polished median subcarinate line, evenly, not very strongly arcuate, slender and about as long as the head and prothorax, the antennæ inserted at the middle, the first funicular joint robust and scarcely longer than the next two, second nearly as long as the third and fourth, slender, almost three-fourths as long as the first, outer joints stouter; club small, robust, scarcely longer than the preceding four joints together, with its basal joint constituting one-half of the mass. Prothorax rather small, conical, tubulate at apex, one-half wider than long, convex and finely, very densely, longitudinally and confusedly rugulose throughout, without median line. Scutellum small, quadrate, scarcely impressed. Elytra large, abruptly much wider than the prothorax, about two and one-half times longer than the latter, hemi-elliptical, the humeral callus small but unusually prominent; disk with fine but deep and abrupt striae, the intervals somewhat feebly rugulose, nearly three times as wide as the grooves, each with a more or less even series of somewhat distant, moderately small, very feeble punctures, each bearing a short subrecumbent seta, often directed transversely or obliquely. Abdomen finely, extremely densely punctate and dull. Prosternum tumid, declivous anteriorly, narrowly, strongly impressed along

the middle, separating the coxæ by scarcely more than one-fourth of their own width. Length 1.8–2.6 mm.; width 0.8–1.25 mm.

Pennsylvania, Indiana, Kentucky and Missouri. A sufficiently common species, the smallest of the genus, rather more convex than usual and with more prominent humeri, but not differing from the others in generic structure. The claws are perfectly free, slender and divergent.

**3 *Idiostethus ellipsoideus* n. sp.**—Rather narrow, elliptical, convex, shining, black throughout, the tibiæ and tarsi piceous; vestiture whitish, consisting above of very small recumbent setæ, slightly wider and closer toward the sides of the pronotum and disposed in a single uneven line on each interval, without larger dispersed squamules on the elytra, but with two or three at each side of the middle of the pronotum near lateral fourth; under surface sparsely squamulose, the prosternum and mes-episterna more densely so, the met-episterna and sides of the abdomen thence to the apex covered with an extremely dense crust of small overlapping feathery scales. *Head* finely but deeply and distinctly, not very sparsely punctate, the beak densely, rugulose so and sparsely squamulose at the sides, with a feebly impressed line of punctures on each side of the narrow subcariniform impunctate line, slender, strongly arcuate, a little longer than the head and prothorax; antennæ inserted beyond the middle, the scape rather long, first joint of the funicle as long as the next four, second nearly one-half as long as the first and almost as long as the next two; club rather large, elongate-oval, densely pubescent, nearly as long as the preceding six joints combined, with the basal joint constituting but slightly more than one-third of the mass. *Prothorax* two-thirds wider than long, the sides feebly convergent and nearly straight to apical fourth, then strongly rounded to the apical constriction; apex truncate, tubulate, one-half as wide as the base, the latter transverse, with the median lobe small but distinct; disk not very coarsely, deeply, unevenly sculptured, longitudinally rugulose toward the narrow abbreviated and subcarinate impunctate line. *Scutellum* minute, quadrate, impressed. *Elytra* quite distinctly wider than the prothorax, and two and three-fourths times as long, nearly one-half longer than wide, hemi-elliptical in outline, the sides becoming parallel and nearly straight in basal half, the humeri small but slightly prominent; disk with not very coarse but deep, abrupt striæ, the intervals flat, about twice as wide as the grooves, each with a single wide, feebly impressed line of coarse but feeble, close-set, somewhat confused and uneven punctures. *Abdomen* very densely punctate. *Prosternum* nearly normal, tumid and strongly, anteriorly declivous. Length 2.6–3.5 mm.; width 1.1–1.7 mm.

Iowa; Missouri.

A distinct species varying considerably in size. Four specimens.

**4 *Idiostethus dispersus* n. sp.**—Oval, rather stout, moderately convex, black; legs rufo-piceous; integuments polished, the vestiture sparse and



uneven, consisting, on the pronotum, of extremely minute setæ which become long slender recumbent whitish squamules in lateral fifth, and in the middle before the scutellum, also with a few widely dispersed over the intermediate regions; on the elytra there is a single series of very small setæ on each interval, with long slender squamules very widely dispersed over the entire surface; on the under surface the squamules are denser and somewhat bristling on the prosternum especially behind, and the smaller white recumbent scales are sparse throughout, but denser on the met-episterna and toward the sides of the last four ventral segments. *Head* finely, rather sparsely punctate, the beak moderately stout, densely punctate and sparsely squamulose along the sides, evenly, distinctly arcuate and equal in length to the prothorax in the male; antennæ inserted near apical two-fifths, the scape rather long and strongly, gradually clavate. *Prothorax* three-fourths wider than long, the sides feebly but distinctly convergent and nearly straight to apical fourth, then strongly rounded to the apical constriction, the apex briefly tubulate, rather more than one-half as wide as the base, the latter broadly, feebly arcuate, the median lobe very small and feeble; disk very unevenly, moderately coarsely and deeply sculptured, the impunctate line narrow but entire, well defined and somewhat elevated; sculpture longitudinally rugulose toward the middle, closely punctate toward the sides, and more finely and very sparsely punctate at lateral fourth toward base. Scutellum minute, quadrate, feebly impressed. *Elytra* hemi-elliptical, fully one-fifth wider than the prothorax and much more than twice as long; sides feebly sinuate toward apex, the latter narrowly rounded; humeri not distinctly prominent; disk with extremely coarse, deep, abrupt and even striæ, the intervals flat, equal, but slightly wider than the grooves, each with a single feebly impressed line of somewhat coarse close-set rounded punctures. Prosternum decidedly tumid with reference to the mesosternum, narrowly, strongly impressed along the middle, separating the coxæ by barely one-third of their width, and, behind them, declivous to the surface of the mesosternum, extending somewhat over the latter. *Abdomen* coarsely, very deeply, rather closely punctured near the base. Length 3.3 mm.; width 1.75 mm.

#### Alabama.

The single specimen is a male, the abdomen having a rather small but deep subbasal impression. This species is not at all closely allied to *tubulatus*, and has the anterior coxæ slightly less narrowly separated.

#### STETHOBARIS.

LeConte—Proc. Am. Phil. Soc., XV, p. 302.

The essential characters distinguishing this genus from others, more closely allied to it in the present section of the tribe, are the large antennal club, nearly as long as the entire funicle and resembling that of *Rhoptobaris*, the small, slender, free but feebly diver-

gent claws, deeply, abruptly and broadly excavated prosternum, not very widely separating the coxæ, peculiar oval, thick and convex form of the body, with prominent humeri situated at quite a noticeable distance behind the base, and the polished black integuments, which are practically entirely glabrous, each puncture bearing an excessively minute seta, only visible under considerable amplification. *Stethobaris* is one of the genera connecting the more normal forms of the tribe with the aberrant *Oomorhynchus* and *Eisonyx*.

The beak is separated from the head by a feeble but distinctly marked transverse impression and is strongly arcuate, moderate in length and thickness, and nearly always noticeably tapering from base to apex, with the antennal scrobes strongly oblique and broadly confluent beneath; the mandibles are short, arcuate and broadly decussate. The tibiæ are deeply and longitudinally sculptured.

The species of *Stethobaris* are moderately numerous, and, with one exception, more than usually homogeneous in external appearance. It is possible, however, that they may be recognized by the characters given in the following table:—

Integuments more or less finely and sparsely punctate, the interstitial punctures of the elytra very minute and sparse.

Sides of the prothorax broadly arcuate, becoming parallel in basal half; pronotal punctures minute and very sparse, becoming larger but not at all confluent at the sides beneath.....1 **corpulenta**

Sides convergent from the basal angles, the prothorax smaller and more conical, less sparsely and more conspicuously punctured.

Prothorax with a distinct but narrow subentire impunctate line; punctures of the elytra confused, at least on the wider intervals; sides of the prothorax beneath obliquely and finely rugose; last ventral segment in both sexes distinctly shorter than the two preceding together.

Elytral grooves very coarse, strongly, remotely punctured, the edges feebly but distinctly serrato-crenulate; form stouter, the prothorax a little more transverse.....2 **incompta**

Elytral grooves less coarse, much more finely punctate at the bottom, the edges never serrato-crenulate, except occasionally very feebly so near the base.....3 **ovata**

Prothorax more conical and more densely punctate, never with a clearly defined entire impunctate line, the punctures beneath at the sides distinct, not forming elongate rugæ; elytral striæ very coarse and remotely but conspicuously punctured, the extremely minute interstitial punctures forming a single line on each.....4 **congermana**

Integuments coarsely, densely punctured, the punctures of the elytra forming a single deep coarse and confluent line on each interval.....5 **egregia**

1 **Stethobaris corpulenta** Lec.—Proc. Am. Phil. Soc., XV, p. 420.

Robust, oval, convex, glabrous, strongly shining and black throughout, the antennæ with the first funicular joint nearly as long as the next four, second to seventh equal in length, the former not as long as wide; club large, evenly elliptical, densely pubescent, equal in length to the six preceding joints combined and equally trisected by the first and second sutures. The prothorax is short, four-fifths wider than long, the sides very strongly, evenly arcuate, convergent anteriorly to the strong apical tubulation, and becoming gradually parallel in about basal half, the apex not quite one-half as wide as the base, the latter broadly, feebly arcuate, the median lobe small but prominent, truncate; disk sparsely, uniformly, very finely and rather feebly punctate, coarsely but not confluent so beneath, the impunctate line narrow, distinct and subentire. Scutellum a little longer than wide, impressed toward apex, quadrangular. Elytra, at a short distance behind the apex, fully one-fifth wider than the prothorax, a little more than twice as long as the latter, the humeri obtusely prominent; outline hemi-elliptical; striæ coarse, deep, with the margins remotely and finely serrato-crenulate toward base; intervals from two to three times as wide as the grooves, minutely, feebly, sparsely and confusedly punctate. Length 3.3 mm.; width 1.8 mm.

Florida (Tampa). Cab. LeConte. I have seen only the unique female type in the Museum of Comparative Zoology at Harvard University.

2 **Stethobaris incompta** n. sp.—Oval, strongly convex, somewhat robust, black, glabrous and strongly shining throughout. Head finely but strongly, sparsely punctate, the beak densely punctured at the sides, evenly, strongly arcuate, moderately slender, distinctly tapering from base to apex and equal in length to the head and prothorax, the antennæ inserted at basal two-fifths, nearly as in *corpulenta*, but with the first funicular joint a little shorter and the club distinctly longer, equalling the entire funicle excepting one-half of the basal joint, with its first joint a little longer than the second. Prothorax about four-fifths wider than long, the sides feebly but noticeably convergent and nearly straight to the middle, then gradually, broadly rounded, becoming strongly convergent to the apical tubule, which is distinctly less than one-half as wide as the very broadly, feebly arcuate base; median lobe of the latter small but distinct, truncate; disk rather finely but deeply, not very densely punctate, with a narrow impunctate median line, the punctures coarser, and forming long oblique rugæ beneath. Scutellum minute, quadrate, scarcely impressed. Elytra, at a little behind the base, barely one-fifth wider than the prothorax, nearly two and one-half times longer than the latter;

humeri obtusely prominent; outline behind them hemi-elliptical; striæ rather coarse, deep, remotely, distinctly serrato-crenulate, the intervals differing greatly in width, the third twice as wide as the grooves, the fourth but slightly wider than the latter, flat, minutely but deeply and distinctly punctate, the punctures confused, sparse but becoming closer toward base, forming nearly even single lines on the narrow intervals. Length 3.1 mm.; width 1.65 mm.

#### Florida.

This species differs from *corpulenta* in its less obese form and larger antennal club, smaller and quite differently shaped, slightly more conical, much more coarsely, deeply and less sparsely punctate prothorax, with the punctures not isolated beneath at the sides, but forming long rugæ; also in its flatter, still more unequal and less polished elytral intervals, with the punctures less minute, deeper and becoming denser toward base; and finally, and quite remarkably, in the form of the mes-epimera, which in *corpulenta* are gradually pointed upward, but much more truncate and rounded in *incompta*. The present species is closely allied to *ovata*, and agrees with that species in all the characters given above to distinguish it from *corpulenta*. It is represented by a single female.

3 **Stethobaris ovata** Lec.—Proc. Acad. Nat. Sci. Phila., 1868, p. 363 (Baridius).

Ovate, polished, black and glabrous, rather strongly convex. Beak moderately slender, strongly arcuate, about as long as the head and prothorax, the antennæ inserted just behind the middle, the first funicular joint robust, about as long as the next three, second quadrate, just visibly longer than the third, two to seven small, the club very large, abrupt, elongate-oval, nearly as long as the entire funicle, densely pubescent throughout and with the basal joint composing but slightly more than one-third of the mass, the second long. Prothorax about two-thirds wider than long, the sides feebly convergent and nearly straight to slightly beyond the middle, then broadly rounded and gradually convergent to the strong constriction; apex tubulate; base broadly arcuate, the lobe distinct, truncate; disk rather finely, sparsely and unevenly punctate, the punctures larger along the basal-margin; impunctate line narrow, entire. Scutellum small, longer than wide, the apex emarginate and the surface impressed posteriorly. Elytra, at a little behind the apex, quite distinctly wider than the prothorax, the humeri large, tumid; outline hemi-elliptical; striæ moderately wide, deep, remotely punctate, abrupt, not at all crenulate, the intervals wide,



flat, generally rather more than twice as wide as the grooves, minutely sparsely and confusedly punctate. Prosternum rather widely, very deeply and abruptly excavated anteriorly, the anterior coxæ small and separated by two-thirds of their own width. Length 2.5–2.8 mm.; width 1.3–1.5 mm.

Massachusetts to Virginia; five specimens, exhibiting comparatively little variation.

**4 *Stethobaris congermana* n. sp.**—Suboval, moderately robust, rather strongly convex, black, polished and glabrous, the legs slightly piceous. *Head* finely, sparsely but distinctly punctate, the transverse impression feeble but distinct, the beak somewhat stout, evenly, moderately arcuate, as long as the prothorax in the male, about one-fourth longer in the female, densely, deeply punctured at the sides, the antennæ inserted at the middle in the female or just beyond in the male, nearly as in *ovata*, the club a little shorter than the entire funicle. *Prothorax* subconical, two-thirds wider than long, the sides rapidly convergent and very feebly arcuate from the base to the strong apical constriction, the apex tubulate and one-half as wide as the base, the latter transverse, bisinuate and somewhat trilobed, the median lobe stronger than the lateral, rounded; disk rather finely, deeply, somewhat closely punctured, the median impunctate line subobsolete. Scutellum small, quadrate, truncate behind and with a deep lunate impression in apical half. *Elytra*, just behind the basal margin, one-fifth wider than the prothorax, two and one-half times longer than the latter and distinctly longer than wide, the humeri rather prominent; sides thence distinctly convergent and broadly arcuate to the apex, which is rather suddenly and broadly subtruncate; disk coarsely, very deeply striate, the grooves conspicuously, remotely punctate, feebly crenulate toward base, the intervals flat, one-half wider than the grooves in the male, nearly twice as wide as the latter in the female, each with a single series of extremely minute feeble punctures. Prosternum broadly, extremely deeply and abruptly excavated anteriorly, the excavation polished and impunctate, short, rapidly narrowed behind and separating the coxæ by not quite two-thirds of their own width. Length 2.8–3.0 mm.; width 1.5–1.8 mm.

Massachusetts; New York; Missouri.

Easily distinguishable from *ovata* by its very coarse, strongly punctured and subcrenulate elytral striæ, with the intervals uniseriately punctate throughout, by its less widely separated anterior coxæ, less transverse, more rapidly conical and more coarsely, closely and evenly punctate pronotum, without a distinctly marked impunctate line, and by several other characters as stated in the table.

**5 *Stethobaris egregia* n. sp.**—Oblong-oval, convex, subglabrous, shining but deeply, densely sculptured, black, the elytra somewhat piceous. *Head* minutely, sparsely but distinctly punctate, the beak rather coarsely, densely so, with the punctures more or less longitudinally coalescent, strongly,

evenly arcuate, as long as the head and prothorax, the antennæ inserted behind the middle, the club very large, more robust than usual, as long as the entire funicle excepting one-half of the basal joint, the latter as long as the next three, second not longer than the third. *Prothorax* less transverse than usual, one-half wider than long, the sides feebly convergent and slightly arcuate to apical third, then rounded to the tubulate apex, which is one-half as wide as the base, the latter transverse, arcuate at the sides, the median lobe distinct; disk with a small, ill-defined elongate impunctate spot behind the middle, the punctures coarse, deep, rounded, dense. Scutellum quadrate, small, strongly impressed. *Elytra* somewhat abruptly nearly one-fourth wider than the prothorax, more than twice as long as the latter and distinctly longer than wide, the humeri moderately prominent, smaller and more basal than usual; sides behind them only moderately convergent, the apex rather broadly and abruptly rounded; disk with coarse deep very abrupt and non-crenulate grooves, the intervals flat, subequal, but slightly wider than the grooves, each with a single series of coarse deep confluent punctures. Length 2.8–3.1 mm.; width 1.4–1.65 mm.

#### Arizona.

In one of the specimens before me the pronotal punctures are very dense, almost in mutual contact, but in the other are separated by one-half of their own diameters, displaying, as in many other species, marked variation in the coarseness and density of sculpture.

### ZAGLYPTUS.

LeConte—Proc. Am. Phil. Soc., XV, p. 236.

In this remarkably distinct genus, the body is minute and sparsely covered with long stiff erect bristles, the beak moderate in length, evenly, feebly arcuate, with the antennæ inserted just beyond the middle, the prosternum broadly, rather feebly impressed along the middle, separating the coxæ by much less than their own width, and the tarsi very slender, the third joint elongate, subcylindrical or feebly obconical and not in the least dilated. *Zaglyptus* was inadvertently placed in the *Cryptorhynchini* by its author.

We have but two species, one of which I do not have before me at present; they are distinguished by LeConte as follows:—

*Elytra* with coarsely punctured shallow striæ, the intervals rather wide.

**1 striatus**

*Elytra* deeply sulcate, the grooves punctured; interspaces narrow; color darker ..... **2 sulcatus**

These species appear to be rare, or at least seldom taken; they are probably of peculiar habits.

**1 *Zaglyptus striatus*** Lec.—Proc. Am. Phil. Soc., XV, p. 237.

Oval, convex, dark red-brown, polished, the upper surface with a few fulvous prostrate hairs in addition to the long stiff setæ, more especially noticeable on the prothorax and toward the base of the beak. Beak quite distinctly longer than the head and prothorax, rather strongly, longitudinally sulcate, slightly punctate toward base; antennæ rather slender, the basal joint of the funicle robust, nearly as long as the next three, two to seven short, coarctate, subequal in length and gradually slightly thicker, club moderate. Prothorax conical, one-half wider than long, the sides feebly inflated and distinctly arcuate at the middle; apex one-half as wide as the base; punctures distinct but not very dense. Scutellum small. Elytra at base abruptly barely one-fourth wider than the prothorax, about twice as long, not longer than wide; sides broadly arcuate, becoming parallel near the base; disk with just visibly impressed series of rather coarse, deep, not very close-set punctures, the intervals nearly flat and fully twice as wide as the stria punctures. Length 1.4 mm.; width 0.8 mm.

Pennsylvania and District of Columbia. The head is impunctate but minutely, densely granulato-reticulate; it is not separated from the beak by a transverse impression. This is the most minute baride known within our faunal limits.

**2 *Zaglyptus sulcatus*** Lec.—Proc. Am. Phil. Soc., XV, p. 237.

Represented by the unique type almost similar in size to *striatus*. Alabama (Mobile).

**OOMORPHIDIUS** n. gen.

It is necessary to separate *Microcholus erasus* and *lævicollis* of LeConte as a very distinctly defined genus, forming a passage from *Stethobaris* to *Eisonyx*, and differing radically from *Microcholus* in its strongly convex body, tubulate prothorax, peculiarly modified elytral striation, impressed prosternum and stout, strongly decussate mandibles. In many of its most striking characters it resembles *Eisonyx*, and in fact is so evidently allied to that genus as to prove the feeble value of ungual structure in the present section of Barini; this is shown also below in the case of *Barinus* and *Bari-lepton*, which are related in much the same way as *Oomorphidius* and *Eisonyx*.

*Oomorphidius* is distinguished by an oval, extremely convex and subglabrous body, rather long, moderately stout, arcuate beak, with broadly arcuate and somewhat advanced epistomal lobe, rather robust legs, with subarcuate femora, dilated third tarsal joint and very small, slender, free and divergent claws. The scutellum is minute. The two species differ subgenerically as follows:—

#### Subgenus I.

Apical constriction of the prothorax not extending across the dorsal surface; prosternum narrowly and feebly sulcate, the sulcus squamose along its edges; anterior coxæ apparently separated by less than one-third of their own width; elytra without dispersed squamules; scutellum nearly as wide as long; size larger, the elytra nearly as in *Eisonyx* and wider than the prothorax.....1 **erasus**

#### Subgenus II.

Apical constriction in the form of a deep abrupt groove, extending without change in character entirely across the dorsal surface; prosternum very broadly, moderately strongly subsulcate, the sides of the impression not well defined and completely glabrous; coxæ separated by one-half of their own width; elytra with a few widely dispersed squamules toward the sides and apex; scutellum elongate, triangular; size small, the prothorax much shorter and equal in width to the basal parts of the elytra.

#### 2 **laevicollis**

#### I.

1 ***Oomorphidius erasus*** Lec.—Trans. Am. Ent. Soc., VIII, p. 217 (*Microcholus*).

Oval, very strongly convex, black, the legs slightly piceous, the antennæ rufescent; integuments smooth, almost completely glabrous and very highly polished, the elytra slightly alutaceous. Head minutely, sparsely punctulate, the transverse impression broad and feeble; beak rather long and somewhat stout, distinctly, evenly arcuate, sparsely, deeply punctate and fully as long as the head and prothorax; antennæ inserted just behind the middle, the scape long, first funicular joint as long as the next three, the second one-half as long as the first and fully as long as the third and fourth combined; club robust, moderate in size, abrupt, densely pubescent. Prothorax nearly one-half wider than long, the sides rather strongly convergent and nearly straight to apical third, then gradually rounded and convergent to the strongly tubulate apex; base broadly, evenly arcuate throughout the width, the lobe obsolete; disk sparsely, extremely minutely and feebly punctate throughout



and glabrous. Scutellum very minute, triangular. Elytra nearly as in *Eisonyx*, broadest just before basal third, where the sides are broadly subangulate, one-fourth wider than the prothorax and a little more than twice as long, the sides strongly convergent behind and feebly arcuate, the apex narrowly subtruncate; disk with but feeble traces of fine impressed striæ, which are abruptly, deeply foveate just behind the basal margin, the intervals very minutely obsoletely sparsely and confusedly punctulate, entirely glabrous excepting a few long recumbent yellowish squamules at the base of the second to fourth intervals. Prosternum narrowly and feebly sulcate along the middle, the sides of the sulcus with recumbent yellowish squamules, the coxæ separated by less than one-third of their own width. Length 4.3 mm.; width 2.3 mm.

Kansas (Topeka). Cab. LeConte. Still represented by the unique type.

## II.

2 ***Oomorphidius lævicollis*** Lec.—Proc. Am. Phil. Soc., XV, p. 304 (*Microcholus*).

Oval, very strongly convex, rapidly narrowed behind, dark rufopiceous, the elytra blackish and the legs paler; body almost glabrous, rather alutaceous in lustre and minutely reticulate. Head almost impunctate, the impression very feeble; beak finely, sparsely punctate, moderately long and slender, strongly, evenly arcuate and fully as long as the head and prothorax, the antennæ inserted at apical two-fifths, slender, the scape rather long, the first funicular joint robust, clavate, not as long as the next three, the second more slender, two-thirds as long as the first and fully as long as the next two combined, club not large, robust. Prothorax very transverse, twice as wide as long, the sides broadly rounded and gradually more convergent from the base to the apical constriction, which is in the form of a narrow deep groove extending entirely across the dorsal surface, the apex strongly tubulate; base broadly, feebly arcuate; disk excessively minutely feebly and sparsely punctured. Scutellum very small, elongate, triangular. Elytra a little longer than wide, two and one-half times as long as the prothorax and equal in width to the latter, with the sides straight and parallel to basal fourth, then, to the narrowly rounded apex, strongly conical with the sides nearly straight; disk with very fine, nearly obsolete striæ, each terminating at some distance behind the basal margin in a mode-

rately deep dilated fovea, the intervals not perceptibly punctulate, the surface glabrous, excepting three or four long slender white squamules widely dispersed laterally, and a few also at the base of the second and third intervals. Prosternum glabrous throughout, the coxæ more widely separated than in *erasus*. Length 2.2 mm.; width 1.1 mm.

Missouri (St. Louis). Cab. LeConte. This remarkable species is still represented as far as I know by the unique type.

### **EISONYX.**

LeConte—Trans. Am. Ent. Soc., VIII, p. 216.

This is perhaps the most aberrant and specialized baride genus within our faunal limits. In general form it is totally unlike our other genera, but is satisfactorily connected in this respect by *Oomorphidius*. The original diagnosis of LeConte will serve for its recognition, but is greatly misleading in several important points. The middle and hind tibiæ are, for example, not in the least conical in outline, but are very thick and quite peculiar in structure, indicating perhaps a burrowing habit; they are strongly carinate externally near the base, then straight for a short distance, then feebly bent outward, becoming distinctly dilated and densely bristling with fulvous setæ. The elytral striæ are not by any means replaced by series of coarse punctures, as stated in the original description, the striæ being all but completely obsolete, but marked by series of exceedingly minute feeble and distant punctures, and terminating at base in larger deep foveæ as in *Oomorphidius*; the large deep circular perforate and widely distant punctures referred to by the author, are unevenly spaced along the middle of the intervals. Each of these large punctures bears a very small slender seta, but some of them, which are widely isolated and a little larger than the others, bear instead a single large white recumbent scale.

The beak is extremely thick, short, feebly arcuate and scarcely three-fourths as long as the prothorax, bristling with coarse erect setæ at the sides toward apex, and the antennæ are inserted slightly beyond the middle, the scrobes being very oblique. Scutellum minute, rather deeply seated, feebly tumid and nude.

1 **Eisonyx crassipes** Lec.—Trans. Am. Ent. Soc., VIII, p. 217.

Rhomboidal, widest between basal third and fourth of the elytra, black, rather dull, finely alutaceous and smooth throughout, convex,

the vestiture extremely unevenly distributed, consisting of a cluster of elongate fulvous squamules among the deep coarse punctures occupying the lateral portions of the anterior thoracic constriction, also at the base before the scutellum and along the margin toward the sides, also with a few similar squamules near the base of the third and fifth elytral intervals; elsewhere on the upper surface, with the exception of the few widely scattered white scales of the elytra, the setæ are very minute. Head almost impunctate, the beak sparsely but deeply so, separated from the head by a transversely arcuate shallow but sharply defined groove. Prothorax finely, feebly and very sparsely punctate, as long as wide, convex, the sides feebly convergent from the base nearly to the apex and straight; base strongly, anteriorly oblique from the scutellum to each basal angle, the median lobe nearly obsolete. Elytra about one-half wider than the prothorax and nearly twice as long; sides about equally and strongly convergent anteriorly to the base of the prothorax, and posteriorly to the very narrow subtruncate and conjointly arcuate apex, the sutural notch completely obsolete. Length 4.8 mm.; width 2.5 mm.

Texas—Cab. LeConte. But two specimens are known, one of which is in the cabinet of Dr. Horn.

### **ZYGOBARIS.**

LeConte—Proc. Am. Phil. Soc., XV, p. 317.

A single widely isolated subtropical species, with coarsely punctured elytral striæ and very long slender strongly arcuate beak, alone constitutes this genus as far as known. LeConte placed here, also, several other small and obscure forms; these, however, belong to widely diverse genera, and have been described under the preceding *Oligolochus* and *Idiostethus*, and *Catapastus* which follows.

*Zygobaris* may be distinguished easily by the structure of the tarsal claws, which are moderate in length and completely connate, without trace of suture, through at least one-third of their length. The mandibles are small, thick, arcuate, notched at apex and strongly decussate. Prosternum flat, separating the coxæ by about their own width, the subapical constriction feeble and only visible laterally, represented in the middle by a small, moderately deep, subtransverse fovea, limited at each side by a small longitudinal ridge. Other generic characters are mentioned below:—

**1 *Zygobaris nitens*** Lec.—Proc. Am. Phil. Soc., XV, p. 318.

Robust, rhomboidal, moderately convex, strongly shining, black, the legs slightly piceous; integuments subglabrous, the vestiture white, consisting of very minute and sparse setiform squamules, with large white scales remotely dispersed but more condensed at the base of the second elytral interval, more distinct but sparse beneath. Beak long and slender, evenly, strongly arcuate, slightly tumid at base with the constriction distinct, feebly compressed and densely punctured at the sides, especially behind the antennæ, two-fifths as long as the body in the male and two-thirds in the female, smoother and less punctate in the latter sex; antennæ inserted at basal two-fifths in the female or a little behind the middle in the male, the scape nearly attaining the eyes, the scrobes almost completely inferior, basal joint of the funicle not quite as long as the next four, the second one-half longer than the third; club moderate, elongate-oval, densely pubescent, with the basal joint composing about one-third of the mass. Prothorax conical, one-half to two-thirds wider than long, the sides feebly, evenly arcuate; constriction rather strong; disk very coarsely, deeply, moderately closely punctate, without trace of impunctate line. Scutellum small, oblong, glabrous. Elytra at base much wider than the prothorax, rather more than twice as long as the latter, parabolic in outline, the humeral callus not laterally prominent; disk with very fine striæ, which are widely and deeply impressed and coarsely, not closely punctate, the intervals convex, each with a single series of coarse deep remote punctures, about as large as those of the striæ but more than twice as distant. Length 2.6–3.7 mm.; width 1.4–2.0 mm.

Southern Florida. A distinct and easily recognizable species.

**CATAPASTUS** n. gen.

This genus contains some of the smallest centrinides thus far discovered, and is rather isolated. Its nearest relative is probably *Zygobaris*, but the divergence from even this form, which is itself a strongly specialized type, is very notable.

The beak is short, stout, broad, flattened toward apex, very densely but finely punctate throughout, squamose and without trace of basal constriction. The antennæ are inserted distinctly beyond the middle, which contrasts greatly with their position in *Zygobaris*, the scape nearly attaining the eye, the basal joint of the



funicle long and the remaining ones small, the club relatively rather large. The mandibles are small, stout, arcuate, notched at apex and broadly decussate. Scutellum small, densely squamose. Prosternum with a broad, moderately deep impression along the middle, which becomes gradually narrower, more profound and more abruptly defined toward apex. Anterior coxæ rather approximate, separated by scarcely one-half of their own width. Tarsal claws small, perfectly connate through about basal third. The two species before me may be readily recognized as follows:—

- Form narrowly rhomboid-oval; prothorax but slightly wider than long; scattered white scales of the elytra long and narrow; legs black; antennæ piceous, with the club abruptly pale rufo-testaceous.....1 **conspersus**  
 Form rather broader, the prothorax much more transverse; scattered white scales larger, broader and much more conspicuous; legs and antennæ pale rufo-testaceous throughout.....2 **diffusus**

1 **Catapastus conspersus** Lec.—Proc. Am. Phil. Soc., XV, p. 318 (Zygobaris).

Narrow, subrhomboidal, convex, black, the antennæ piceous-black with the club rufous; vestiture dense, consisting of small narrow dark red-brown squamules, which are broader, denser and nearly white beneath, and with larger white scales remotely dispersed on the elytra and more or less dense toward the sides of the pronotum, the scutellum densely clothed with white scales. Beak thick, feebly flattened toward apex, evenly, rather strongly arcuate, as long as the prothorax in the male and scarcely longer in the female, densely punctate and squamose, the basal constriction obsolete; antennæ inserted distinctly beyond the middle in both sexes, basal joint of the funicle about as long as the next four, second but slightly longer than the third; club rather large, oval, densely pubescent, with the basal joint constituting one-third of the mass and not longer than the second. Prothorax fully one-third wider than long, conical, the sides arcuate at apical third, the constriction distinct; apex three-fifths as wide as the base; punctures somewhat coarse, very deep and dense, without impunctate line; basal lobe very small. Elytra distinctly wider than the prothorax and a little more than twice as long, narrowly parabolic in outline, the striæ rather coarse, abrupt, normal; intervals flat, about one-half wider than the grooves, finely but strongly, confusedly and rather rugosely punctate. Length 1.7–2.3 mm.; width 0.8–1.1 mm.

Illinois, Michigan and Iowa; numerous specimens. One example is labeled "Florida," but I think by mistake.

2 **Catapastus diffusus** n. sp.—Rhomboid-oval, rather stout, convex, black, the legs and antennæ throughout pale rufo-testaceous: vestiture as in *conspersus*, the scattered white scales of the elytra larger and broader. *Head* finely, very densely punctate, the impression obsolete; beak and antennæ nearly similar to those of *conspersus*. *Prothorax* one-half wider than long, conical, the sides feebly, evenly arcuate; subapical constriction distinct; apex truncate, a little more than one-half as wide as the base, the latter transverse, the median lobe small but rather prominent; disk coarsely, very densely punctate, with traces of a fine impunctate line. *Scutellum* small, rounded, very densely clothed with white scales. *Elytra* distinctly wider than, and obviously more than twice as long as, the prothorax, parabolic, the humeral callus rather prominent laterally; disk not coarsely, deeply, abruptly striate, the intervals flat, twice as wide as the grooves, finely, closely, confusedly and subtransversely punctato-rugose. *Abdomen* nearly flat, closely punctured and moderately densely squamulose, the middle of the third and fourth segments glabrous except along the apex; fifth segment rather longer than the two preceding. Length 2.2 mm.; width 1.15 mm.

Florida (southern).

This species is closely allied to *conspersus*, and resembles it in structure and vestiture, but differs in its slightly more robust form, pale legs and antennæ, more transverse and more coarsely punctured prothorax, and in several other characters. It is described apparently from the female, but there is very little sexual disparity in this genus.

### BARINUS.

Casey—Bull. Cal. Acad. Sci., II, 1886, p. 255.

In this genus the beak is as short, thick and arcuate as in *Baris*, although beyond this mere suggestion, there is nothing at all in common. As in *Barilepton*, to which *Barinus* is closely allied, the head is larger in proportion to the size of the prothorax than in any of the other genera, and the tarsi have the second and third joints dilated, very broadly so in *bivittatus*, but *Barinus* can always be readily distinguished by the tarsal claws, which are two in number and completely connate through at least one-half of their length.

The antennæ are inserted just beyond the middle of the beak, very near the median line of the flank, the scrobes rapidly oblique, the scape nearly attaining the eye, the club moderate and the basal joint of the funicle unusually long, although varying somewhat in length in the different species. The mandibles are small, stout, feebly arcuate externally, decussate and with a large internal notch.

Prosternum more or less deeply and narrowly impressed or sulcate, the coxæ large, prominent and narrowly separated. The met-episternum varies in width according to the species, and the abdomen is convex, becoming strongly ascending toward apex, where it is generally retracted slightly above the plane of the sutural angles of the elytra. The scutellum is small, glabrous or nearly so and the body is always unevenly and more or less densely squamose.

The species are moderately numerous; those known to me may be identified as follows:—

Body glabrous above, with two wide, abruptly limited vittæ of large pale densely placed scales, the outline evenly elongate-oval... 1 **bivittatus**

Body elongate-oval, unevenly squamose above, the scales forming shorter or longer lines on the elytral intervals or, when the latter are densely squamose throughout, with the intervals two, four and six in greater or less part paler, especially toward base.

Elytra not densely squamose throughout.

Elytral punctures fine, the sixth interval with a broad dense line of scales, abruptly terminating at basal fourth; white scales of the second interval not extending beyond apical fifth..... 2 **cribricollis**

Elytral punctures coarse and dense, the sixth interval with the line of large white scales extending fully to the middle and thence nearly to apex, but with narrower, sparser and darker scales; second interval broadly clothed with large white scales from base to apex.

### 3 **squamolineatus**

Elytra densely squamose throughout, the scales ochreous-brown in color, but white on the alternate intervals through portions of their extent and more especially toward base.

Prothorax with the scales of the under surface large and dense throughout toward the sides; pronotal punctures rather finer and moderately close.

### 4 **suffusus**

Prothorax with a large quasi-denuded area involving the lateral portions of the under surface toward base, on which the scales become very fine and sparse; pronotal punctures coarse and denser..... 5 **difficilis**

Body unevenly squamose above, the scales of the elytra not at all lineate in arrangement, but more or less denuded, especially on the flanks and often also at the posterior callus.

Body more broadly oval.

Vestiture dense, the anterior coxæ separated by about one-fourth of their own width..... 6 **lutescens**

Vestiture sparse, the scales narrower; anterior coxæ separated by nearly one-half of their own width..... 7 **curticollis**

Body narrow and linear, almost as in the second division of Barilepton.

Vestiture of the pronotum broadly and abruptly dense toward the sides, the median glabrous area occupying but slightly more than one-third of the total width..... 8 **albescens**

Vestiture of the pronotum sparse and evenly distributed throughout, although slightly sparser in a feebly defined, oblique line at each side, extending from the middle at lateral fourth to the scutellar lobe, not at all condensed toward the sides.....9 **linearis**

1 **Barinus bivittatus** Lec.—Proc. Am. Phil. Soc., XVII, p. 431 (Bari-lepton).

Elongate-oval, convex, polished, black with a faint violaceo-metallic lustre, the legs dark rufo-piceous; vestiture of the dorsal surface very minute except a broad vitta on each side, extending from the apical margin of the pronotum to the elytral apex, of large, broad, densely placed, yellowish-white scales, the meso- and meta-sternal episterna and margins of the abdomen similarly clothed with denser scales. Head excavated beneath; front with a large feebly impressed fovea but without transverse constriction, the beak stout, cylindrical, scarcely compressed, evenly, moderately arcuate, three-fourths as long as the prothorax, polished, coarsely punctured toward base, the antennæ inserted just beyond the middle, a little nearer the upper than the lower margin, the basal joint of the funicle very slender and as long as the entire remainder, the club small, elongate-oval, as long as the four preceding joints combined. Prothorax not quite as long as wide, feebly inflated at apical third, the sides thence straight to the base; subapical constriction strongly marked, the apex two-thirds as wide as the base, the latter transverse, the basal lobe obsolete; disk rather coarsely but not very densely punctate, the impunctate line narrow, irregular and entire. Scutellum small, a little wider than long and rather deeply seated. Elytra equal in width to the prothorax and twice as long, the sides evenly, gradually convergent from base to apex and very feebly arcuate, the apex narrowly but obtusely rounded; humeri not prominent; striæ fine but deep and abrupt, the intervals wide, minutely, rather sparsely and confusedly punctate, the fourth very narrow toward base. Prosternum narrowly, moderately deeply sulcate along the middle, separating the coxæ by only one-third of their own width. Tarsi very broad, the posterior as long as the tibiæ, with the first joint small but wider than long, the second and third equal in width and both very strongly dilated, squamose above, densely pilose beneath, the third with a narrow median emargination extending to basal third; fourth joint very slender, extending only slightly beyond the lobes of the third, the claws small, parallel and completely con-



nate through fully one-half of their length. Length 5.3 mm.; width 1.8–2.0 mm.

Georgia (St. Catharine Island). This is the most conspicuous and one of the most interesting barides within our faunal limits, remarkable not only in ornamentation, but in its extremely dilated tarsi and very elongate basal joint of the antennal funicle.

2 **Barinus cribricollis** Lec.—Proc. Am. Phil. Soc., XV, p. 422 (Barilepton).

Elongate-oval, convex, polished, black, the legs slightly piceous; vestiture very uneven, consisting of large white densely placed scales in a sublateral pronotal vitta, on the second elytral interval except near the apex, where they are gradually replaced by small narrow dark brownish squamules, on the third for a short distance behind the middle, on the fourth near the base and from basal to apical fourth, and on the sixth in the broadest and most conspicuous line of all, abruptly confined to basal fourth of the length; on the under surface the white scales are dense and conspicuous in a small spot near the anterior coxæ, on the inner half of the mesepisterna, throughout the met-episterna, and toward the sides of the abdomen, much more densely on the third and fourth segments and becoming fine, browner and sparser toward the apical angles of the second segment, which is more reflexed posteriorly at the sides than the third or fourth. Beak extremely short, thick, arcuate, not more than two-thirds as long as the prothorax, strongly punctured toward base at the sides, the basal joint of the antennal funicle as long as the entire remainder and slightly longer than the club. Prothorax very nearly as long as wide; sides parallel and straight in basal two-thirds, then gradually rounded, feebly convergent and rather strongly constricted to the apex, the latter three-fourths as wide as the base; disk coarsely punctate, the punctures circular, deep, perforate and quite distinctly separated; impunctate line evident in basal two-thirds. Elytra distinctly wider than the prothorax and fully twice as long, narrowly, obtusely rounded at apex; striæ moderately coarse; intervals flat and unequal, about twice as wide as the grooves, finely, not densely and more or less confusedly punctate. Prosternum deeply, longitudinally impressed, the coxæ very prominent, almost conical, separated by less than one-third of their own width. Length 3.6 mm.; width 1.35 mm.

Florida (Enterprise). Cab. LeConte. Represented by the unique

type, which is in a perfect state of preservation. All of the punctures of the upper surface, except where densely covered with scales as described above, bear each a very small inconspicuous seta.

3 **Barinus squamolineatus** Cas.—Bull. Cal. Acad. Sci., II, p. 256.

Elongate-oval, convex, black, the legs red; elytra coarsely, very densely sculptured; upper surface in great part covered with large white closely placed scales, which are replaced toward the sides of the elytra by smaller browner squamules, becoming fine inconspicuous setæ toward the humeri, also very inconspicuous on the first interval except toward the scutellum, and in middle half of the pronotum, except along the median line; pronotum in entire lateral fourth and second elytral interval throughout clothed very densely with large scales. Length 3.1–3.7 mm.; width 1.2–1.3 mm.

Illinois; several specimens. This species is allied to *cribricollis*, but differs in its slightly longer, less robust and arcuate beak in the smaller punctures and much broader, denser lateral vitta of the pronotum, in the very much coarser, deeper and denser punctures, and more conspicuous vestiture of the elytra, paler legs and in many other characters.

In my original description, the sculpture of the elytral intervals is stated to be finely and feebly punctate; this mistake arose from the fact that in the single type specimen, the dense scales in great part covered and concealed the punctures; in some denuded examples before me, however, they are readily seen to be coarse and deep, and, in comparison with those of *cribricollis*, very large indeed. The types of both *cribricollis* and *squamolineatus* are males.

4 **Barinus suffusus** n. sp.—Elongate-oval, convex, black, with the legs red, moderately shining but extremely densely covered throughout with large brownish scales, becoming broadly white toward base of the sixth interval, also feebly whiter on the second and fourth near the base and behind the middle, also broadly white in lateral fourth of the pronotum and toward the sides of the body beneath; median half of the pronotum sparsely clothed with slender but distinct squamules, becoming broad dense scales on the median line toward base, the scutellum abruptly black and glabrous, small, triangular, widest behind and lying in a broad shallow depression between the elytra. *Head* and beak glabrous but with an abruptly dense line of large scales bordering the eye anteriorly, the former finely but strongly, not very sparsely punctate, the transverse constriction feeble but evident; beak thick, compressed, strongly arcuate and distinctly punctate toward base, straighter and feebly flattened toward apex, about four-fifths as long as the prothorax in the female;

antennæ inserted a little beyond the middle, the basal joint of the funicle not quite as long as the next six, club as long as the preceding five joints, rather elongate, oval, densely pubescent, with the basal joint constituting less than one-half of the mass. *Prothorax* perceptibly shorter than wide, the sides straight and parallel in basal two-thirds, then broadly rounded, feebly convergent and broadly constricted to the apex, which is three-fourths as wide as the base, the latter transverse, the median lobe very small, feeble; disk rather finely and somewhat closely punctate, the punctures very distinctly separated; impunctate line feebly defined; apical margin polished and impunctate for a short distance throughout the width. *Elytra* distinctly wider than the prothorax and a little more than twice as long, elongate, hemi-elliptical in outline, the apex with a feeble sutural notch, the humeral callus long but not prominent; disk moderately striate, the intervals flat, confusedly, coarsely punctate when denuded. Prosternum deeply impressed along the middle, rather narrowly separating the coxæ as usual. Fifth ventral segment with a small impressed and denuded median area, the last three segments rapidly ascending in the female type, convex, and, at the extreme apex, retracted above the plane of the elytral apices. Length 3.6 mm.; width 1.4 mm.

#### Texas.

A single specimen, which appears to be a female, the abdomen being entirely devoid of median impression toward base. The species is allied to *squamolineatus*, but is easily distinguishable by the dense crust of scales, and the much finer denser punctures and conspicuous squamules of the pronotum.

5 **Barinus difficilis** n. sp.—Elongate-oval, convex, black, shining, the legs rufous; vestiture dense, consisting of large close-set scales, pale brown in color but gradually white in basal half on the second and sixth intervals, and also on the fourth very near the base, also broadly white and dense at the sides of the pronotum and on the under surface toward the sides, but with a large subdenuded spot on the prothorax just before the mesosternal side-pieces, which is sparsely clothed with long slender squamules; median parts of the pronotum rather sparsely clothed with very long, wider and narrower, brown scales, which are conspicuous. *Head* finely, sparsely punctate, glabrous, the eyes margined anteriorly with an abrupt line of coarse scales; impression feeble but distinct; beak glabrous, thick, strongly arcuate and densely punctate toward base, much shorter than the prothorax, the basal joint of the antennal funicle distinctly shorter than the remainder; club moderate. *Prothorax* not quite as long as wide, the sides parallel and nearly straight to apical third, then broadly rounded and moderately convergent to the apex, the constriction almost completely obsolete; disk coarsely, deeply and closely punctate, the punctures not in actual contact; median impunctate area fusiform. Scutellum moderate, quadrate, tumid, not deep-set, glabrous but squamulose at the sides. *Elytra* slightly wider than the prothorax and a little more than twice as long, elongate hemi-elliptical, the sides becoming parallel toward base and very feebly constricted at apical fourth; humeri

not prominent; disk rather finely striate, the intervals wide, flat, not coarsely but very densely, deeply, confusedly punctate. *Abdomen* clothed throughout with large dense scales, which are sparse in the subbasal indentation and toward the middle of the last three segments. Prosternum normal, rather narrowly separating the coxæ. Length 3.25 mm.; width 1.25 mm.

California (southern).

This species is rather closely allied to *suffusus*, but differs in its much more sparsely punctate head, in its coarser, denser punctures, narrower lateral vittæ, more uneven and more conspicuous vestiture of the median parts of the pronotum, and in the denuded area beneath, the latter being entirely wanting and clothed with large dense normal scales in *suffusus*. It also differs in having the met-episterna decidedly narrower, and the elytra covered with a dense crust of scales which entirely conceal even the striæ, the latter being indicated by wide partings of the scales in *suffusus*.

6 **Barinus lutescens** Lec.—Trans. Am. Ent. Soc., VIII, p. 218 (Bari-lepton).

Rather robust, oval, the upper surface only moderately convex, black, the legs piceous-black; integuments shining, densely clothed with large ochreous scales, which are rather elongate, evenly distributed on the elytra, where they become gradually semi-erect behind and denuded at the sides in more than basal half, also broadly dense at the sides of the pronotum, the median glabrous area oval in outline; under surface polished and with very minute remote setiform squamules, which are abruptly dense and broader on the met-episterna and at the sides of the abdomen behind. Beak thick, strongly arcuate and punctured at base, three-fourths as long as the prothorax, the transverse impression very broad; surface glabrous but with a few very small, scarcely visible squamules near the anterior margin of the eye; basal joint of the antennal funicle as long as the next five; club rather small, but slightly longer than the preceding four joints combined. Prothorax fully one-third wider than long, the sides parallel and nearly straight in basal two-thirds, then broadly rounded, convergent and scarcely at all constricted to the apex, the latter scarcely more than one-half as wide as the base; disk rather coarsely and sparsely punctate, the punctures becoming smaller and much denser anteriorly. Scutellum very small, tumid, quadrate, glabrous and polished. Elytra scarcely perceptibly wider than the prothorax and a little more than twice as long, parallel, parabolically rounded in apical two-fifths, the subapical sinuation



very feeble and the sutural notch broad; disk rather finely striate, the intervals rather finely, moderately densely punctured. Prosternum rather deeply but very narrowly sulcate, the coxæ large, prominent, separated by scarcely more than one-fourth of their own width. Length 3.2 mm.; width 1.3 mm.

Texas (Columbus). Cab. LeConte. The unique type is the only specimen which I have seen; it is a female. This species is allied to *albescens*, in spite of the great dissimilarity in form of the body; the arrangement of the vestiture beneath is almost identical, but *lutescens* does not possess the denuded subapical spot of the elytra, is much more coarsely punctate, and differs in so many characters that there cannot, I think, be the least doubt of its distinctness.

**7 *Barinus curticolis* n. sp.**—Rather narrowly oblong-oval, somewhat convex, polished, black, the legs dark rufo-piceous; vestiture yellowish, consisting, on the pronotum, of dense elongate-oval scales in lateral third, on the elytra of nearly similar scales almost uniformly but not very densely distributed throughout, becoming finer and still sparser on the flanks, very sparse throughout beneath, except on the met-episterna, where they are much denser, also denser at the sides of the last three ventral segments. *Head* dull, finely, sparsely punctate, the impression distinct; beak short, thick, very strongly arcuate, not as long as the prothorax, coarsely but sparsely punctate, somewhat squamulose above the eyes; antennæ slender, the basal joint of the funicle not quite as long as the remainder, club moderate. *Prothorax* short, two-fifths wider than long, the sides parallel and straight to apical third, then gradually rounded convergent and nearly straight to the apex, which is three-fifths as wide as the base, the latter transverse, the median lobe broad and feeble; disk coarsely, rather sparsely punctate, the punctures round, deep, perforate and isolated, with a narrow and irregular impunctate line. *Scutellum* small, oval, tumid and glabrous. *Elytra* slightly wider than the prothorax and nearly two and one-half times as long, elongate hemi-elliptical, obtusely rounded at apex, the humeri not laterally prominent; disk deeply striate, the intervals flat, from two to three times as wide as the grooves, coarsely, confusedly but not very densely punctate. *Abdomen* finely, remotely punctate, the basal segment coarsely and much more closely so. Anterior coxæ separated by about one-half of their own width. Length 2.7–3.0 mm.; width 1.0–1.2 mm.

Missouri; Louisiana.

The description is drawn from the male, the abdomen having a small deep elongate-oval impression near the base. This species is allied to *lutescens*, but differs in its shorter prothorax, narrower form, more slender, much sparser scales of the elytra and more widely separated anterior coxæ.

8 **Barinus albescens** Lec.—Trans. Am. Ent. Soc., VIII, p. 218 (Bari-lepton).

Elongate, subparallel, somewhat wider toward posterior third of the elytra, black, the legs red, convex, polished with a very faint violaceo-metallic lustre; vestiture pale ochreous-white of different shades, very dense but uneven in distribution, consisting of large elongate scales, abruptly dense in lateral third of the pronotum and on the elytra throughout, except along the flanks and in a discal spot near the apex, these denuded areas and the median parts of the pronotum having the squamules exceedingly minute, sparse, and setiform; squamules of the sutural interval also finer and darker toward apex, and the entire vestiture in apical fourth erect and bristling, especially at the intersection of the third and ninth intervals, behind the feeble subapical callus; vestiture of the under surface very minute and sparse, but denser on the met-episterna and at the sides of the abdomen behind. Beak three-fourths as long as the prothorax, very thick and arcuate, punctured toward base, the constriction strong, the eye bordered anteriorly by a line of three or four subrecumbent scales; antennæ with the basal joint of the funicle as long as the next five, the club rather large, pale, nearly as long as the preceding six joints. Prothorax a little wider at apical third than at base, then very strongly convergent and deeply constricted to the apex, which is three-fourths as wide as the base; sides nearly straight; punctures fine and sparse. Scutellum very small, subglabrous. Elytra at base scarcely noticeably wider than the prothorax, the sides straight and extremely feebly divergent thence to apical third, then broadly rounded, constricted at apical fifth, the apex obtuse; humeri very feebly swollen; striæ fine; intervals almost impunctate in the denuded lateral area. Femora bristling beneath with long setæ. Prosternum longitudinally, narrowly sulcate, the coxæ narrowly separated. Length 2.7 mm.; width 0.9 mm.

Texas (Columbus). Cab. LeConte. Represented, as far as I know, by the unique type, taken by Mr. Schwarz. This species bears no resemblance, in any way, to *linearis*, with which it is accidentally united in the Henshaw Check-list, except in its generally narrow subparallel form.

9 **Barinus linearis** Lec.—Proc. Am. Phil. Soc., XV, p. 422 (Bari-lepton).

Elongate, parallel, convex, black throughout, smooth but alutaceous in lustre, the vestiture white, consisting of moderately large,

broad, triangular scales, almost evenly and quite sparsely distributed throughout but more denuded and sparse along the sides of the elytra, more broadly so toward base, and also in a small discal spot near the apex; on the under surface the scales are dense on the met-episterna and toward the sides of the abdomen behind, elsewhere sparse but only absent on that part of the mesosternum bounding the middle coxal cavities externally. Head impunctate, but with a few extremely minute feeble punctures anteriorly; beak glabrous, punctate, very thick toward base, with some large scales bordering the eyes, much shorter than the prothorax; basal joint of the antennal funicle scarcely as long as the next four together; club moderate. Prothorax not quite as long as wide, the sides straight and parallel or very feebly divergent to apical two-fifths, then rounded and convergent, the constriction very broad and feeble; apex not more than three-fifths as wide as the base; disk finely, rather unevenly but not very closely punctate, the scales almost uniformly distributed and sparse throughout; impunctate line distinct, entire. Elytra just visibly wider than the prothorax and a little more than twice as long, parallel, narrowed in apical third, then obtusely rounded; striae fine; intervals flat, rather finely, unequally, confusedly and not very closely punctate. Prosternum impressed, the coxæ large, prominent, rather narrowly separated. Length 3.7 mm.; width 1.25 mm.

Florida (Sumter Co.). Cab. LeConte. Represented by the unique type, in which the last ventral segment has a rounded glabrous polished and extremely deep median excavation.

### **BARILEPTON.**

LeConte—Proc. Am. Phil. Soc., XV, p. 318.

The species of *Barilepton* are probably the most slender of the *Barini*. The beak is short, thick, arcuate, strongly compressed, with the flanks crossed obliquely by the antennal scrobes, the latter beginning near the upper margin and slightly beyond the middle. The under surface of the head is frequently excavated transversely as in *Barinus*, and the basal joint of the funicle is elongate. The prosternum is broadly impressed and very narrowly separates the coxæ. One of the most remarkable characters of the genus is the structure of the tarsi, in which however it strongly resembles *Barinus*; the four posterior tarsi are almost invariably longer than the tibiæ, and have the second and third joints dilated, the first being

much smaller. There is but one tarsal claw, which is simple and moderately stout.

The close relationship existing between *Barilepton* and *Barinus* affords another illustration, parallel to that of *Eisonyx* and *Oomorphidius* previously mentioned, of the slight value to be attached, among some of the centrinide genera, to radical differences in the tarsal ungues, in comparison to the significance attending these modifications in the baride series.

Our four species of *Barilepton* may be thus defined:—

Elytra at base not wider than the base of the prothorax.

Beak almost evenly arcuate.....1 **filiforme**

Beak strongly bent near the base; body much smaller and still more slender; pronotal vestiture decidedly sparser.....2 **famelicum**

Elytra at base wider than the contiguous base of the prothorax; form a little stouter, the prothorax much less elongate.

Prothorax constricted behind the apex; antennal club robust; basal joint of the hind tarsi longer, the second not quite as wide as the third and rather longer than wide, the third a little wider than long.

3 **quadricolle**

Prothorax without trace of subapical constriction; antennal club much less robust; basal joint of the hind tarsi shorter and thicker, the second equal to the third and not longer than wide, the third scarcely as wide as long.....4 **falciger**

1 ***Barilepton filiforme*** Lec.—Proc. Am. Phil. Soc., XV, p. 319.

Cylindrical, convex, shining but very densely clothed with large broad pale scales, sparser on the pronotum except at the sides, pale fulvous on the elytra but white along the flanks and in a feebly defined streak attaining the base at each side of the scutellum. Head and basal parts of the beak punctured and squamose, the impression obsolete but with a small inconspicuous median fovea; beak distinctly shorter than the prothorax, stout, arcuate, compressed toward base, smooth and almost impunctate, the antennæ inserted near the middle, the basal joint of the funicle as long as the next five together, the second slightly longer than the third; club moderately stout, as long as the first funicular joint, the basal joint apparently large. Prothorax about as long as wide, sometimes feebly dilated at apical third, generally parallel, broadly rounded toward apex, the constriction obsolete; apex fully three-fourths as wide as the base; punctures deep, moderately coarse and not quite in mutual contact. Elytra about as wide as the prothorax and barely two and one-half times as long, the fine striæ indicated by narrow



partings of the very dense crust of scales. Prosternum feebly impressed, separating the coxæ by one-fifth or sixth of their own width. Second tarsal joint almost as wide as the third and nearly as long as wide. Length 2.5–2.9 mm.; width 0.7–0.85 mm.

Michigan and Illinois; also said by LeConte to occur in Virginia. Five specimens.

**2 *Barilepton famelicum* n. sp.**—Very slender, cylindrical, convex, black, shining, the scales moderately large and broad, sparse and slender on the median parts of the pronotum, dense throughout on the elytra, very sparse, minute and narrowly lineate throughout on the abdomen except the sides of the last three segments, which are densely squamose. *Head* finely, sparsely punctate and squamulose; beak punctured and sparsely squamose toward base, elsewhere smooth and polished, compressed, thick, scarcely more than three-fourths as long as the prothorax, very strongly arcuate near the base, nearly straight in apical two-thirds, the antennæ inserted at or slightly behind the middle, the basal joint of the funicle longer than the next four, the club robust, a little shorter than the preceding six joints together. *Prothorax* fully as long as wide, often apparently a little longer, the sides parallel, nearly straight, feebly convergent and slightly rounded near the apex, the latter fully four-fifths as wide as the base, which is transverse, the median lobe almost obsolete; subapical constriction completely wanting; disk finely, rather sparsely and unevenly punctate. Scutellum very small, quadrate, glabrous, with one or two setæ at each side. *Elytra* equal in width to the prothorax and about two and one-half times as long, parallel; sides convergent in apical third, the apex obtusely rounded; humeri not prominent; disk with very fine striæ, the intervals wide, flat, densely, confusedly squamose. *Abdomen* sparsely punctate. Prosternum transversely constricted behind the apex, broadly, distinctly impressed along the middle, separating the coxæ very narrowly. Middle and posterior tarsi longer than the tibiæ, the second joint not quite as wide as the third but much wider than the first. Length 2.1–2.65 mm.; width 0.4–0.7 mm.

Colorado (Greeley). Mr. H. F. Wickham.

This very small species is closely allied to *filiforme*, but may be distinguished by its smaller size, more slender form, sparser and more slender scales especially on the pronotum and along the median parts of each elytron, and also by the form of the beak which is more abruptly and strongly arcuate near the base. Seven specimens.

**3 *Barilepton quadricolle* Lec.**—Proc. Am. Phil. Soc., XV, p. 423.

Cylindrical, convex, black, the legs rufescent; integuments shining but densely clothed with pale scales, narrow on the pronotum, broad and denser on the elytra, moderately dense on the abdomen. Head sparsely, finely punctate, the impression obsolete; beak thick, about

as long as the prothorax, compressed, smooth, polished, punctured and squamose near the base, strongly, abruptly arcuate at base but nearly straight and gradually feebly flattened thence to the apex; antennæ inserted near the middle, the basal joint of the funicle as long as the next four. Prothorax slightly wider than long, swollen at the sides anteriorly and wider at apical third than at base, the sides convergent and feebly constricted thence to the apex, the latter barely two-thirds as wide as the base; disk rather closely, strongly, unevenly punctured, with a narrow impunctate median line. Scutellum very small, quadrate, glabrous. Elytra quite distinctly wider than the base of the prothorax, feebly subinflated behind the middle, distinctly more than twice as long as wide, the humeral callus slightly prominent; striæ fine, deep and abrupt; intervals flat. Prosternum broadly, deeply impressed along the middle, the margins of the impression not abruptly defined; transverse constriction moderately distinct; anterior coxæ separated by one-fifth of their own width, the intermediate by slightly less than their width. Length 3.1–3.3 mm.; width 1.0–1.1 mm.

Nebraska. Distinct from *filiforme* in its larger size, more robust outline, elytra wider than the prothorax, longer beak and many other characters.

**4 Barilepton falciger** n. sp.—Cylindrical, convex, black throughout, shining and with a feeble violaceo-metallic lustre, densely clothed on the elytra with rather large, pale scales, which are sparse and narrower on the pronotum, also dense toward the sides of the sterna and last three ventral segments. *Head* rather finely, closely punctate, almost impunctate and broadly excavated beneath; basal constriction obsolete, the outline straight in profile; beak short, robust, sickle-shaped, very strongly bent at basal third and strongly compressed, slightly flattened toward apex, smooth, polished, punctured toward base, not quite as long as the prothorax, the antennæ inserted just beyond the middle and near the upper margin, the scrobes rapidly oblique along the flattened flanks, the basal joint of the funicle longer than the next four, obconical, the second much narrower, cylindrical, not quite as long as the next two, outer joints more robust; club moderate, nearly as long as the preceding six joints. *Prothorax* but slightly wider than long, the sides feebly divergent and nearly straight to apical third, then rounded and convergent to the apex, the constriction obsolete; apex three-fourths as wide as the base; disk not very coarsely, somewhat unevenly punctate, the punctures well separated; narrow impunctate line distinct. Scutellum very small, nearly glabrous. *Elytra* not at all wider than the disk of the prothorax, but, at base, just visibly wider than the base of the latter, distinctly more than twice as long as wide, parallel, parabolic in apical third; humeri not prominent; disk with a more prominent humeral condensation

of scales, finely striate. *Abdomen* strongly but sparsely punctate. *Prosternum* with a broad median impression, the *coxæ* narrowly separated. Length 2.75 mm.; width 0.8 mm.

California (San Bernardino).

The four hind tarsi are much longer than the tibiæ, the basal joint of the posterior obconical and distinctly shorter and narrower than the second, the latter large, as wide as long and fully as wide as the third, which is not transverse but narrowly deeply emarginate, the fourth joint is rather short and very slender. The type is a male, having a long narrow impression near the base of the abdomen.

**EUNYSSOBIA** n. n.

*Euchaetes* || LeConte—Proc. Am. Phil. Soc., XV, p. 319.

This genus was proposed by LeConte, unfortunately under a name which had been employed several times before in zoology, for one of the most remarkable curculionides thus far discovered. Its aberrant nature was in fact only partially known to its author, who makes no reference whatever to the mandibles. The general habitus of the body, abdominal structure and conformation of the mes-epimera, show that it is a normal member of the Barini, but its rostral and mandibular characters indicate that it should be widely isolated, forming with *Plocamus* a group or subtribe.

The beak is extremely slender, cylindrical and strongly arcuate, but becomes abruptly inflated and thickened behind the antennæ, the under surface of the dilated portion having a narrow deep groove along the middle, which is gradually narrowed posteriorly and confluent at base with a deep transverse constriction, extending upward at the sides just in front of the eyes, becoming gradually attenuated and extinct and not attaining the upper surface. This longitudinal groove is but a remnant of the usual channel formed by the confluent scrobes, and is far too narrow to receive the antennal scape, the latter being free. The antennæ are completely inferior in insertion and are situated between basal third and fourth in both sexes, the scape rather thick, short and extending to the under surface of the head between the eyes, the latter being normal and widely separated beneath.

The mandibles are very short and thick, compressed, bent upward and move in a nearly vertical plane as in *Balaninus*, the condyles being contiguous above and received in broad deep fissures at the

sides of the buccal opening beneath; the upturned apex is very coarsely and deeply notched. It can be readily seen that in this position, the condyles have the largest and most powerful muscular attachment permissible under the circumstances. The habits of this species, as well as *Balaninus*, necessitate a slender cylindrical boring tool, not at all enlarged at apex, and, if the condyles were horizontal in their plane of motion, they would, because of their slight lateral development, be very feeble in muscular action; they have therefore been gradually turned into a position as nearly vertical as possible, simply to allow of a broader base for the attachment of the muscles. Mandibles of this kind are of course incapable of grasping or pinching to any useful degree, and can be used only in cutting and scraping a passage for the advancing beak, and it does not follow at all that because the mandibles are similar in their action to those of *Balaninus*, that there is any special relationship between these genera. In point of fact the remaining structural characters of the body, including the form of the mandibles themselves, are so widely different in *Balaninus* and *Eunyssobia*, that there cannot be the least affinity between them, except in the method of using the beak as a boring instrument.

The buccal fissure is very narrow and deep, being, at the anterior extremity, not more than one-fourth as wide as the rostrum, and the mentum is long and extremely slender; the remaining organs of the mouth appear to be atrophied or very feebly developed. The prosternum is broad, strongly, transversely constricted behind the apex but not otherwise modified, and separates the rather small coxæ by nearly twice their own width. The legs are normal, the tarsi very slender, with the two basal joints elongate, feebly obconical and subequal, the third small, scarcely wider than the apex of the second, deeply emarginate, the fourth with its basal node, about as long as the first two together; claws rather slender, arcuate, simple and divergent. Pygidium completely concealed.

1 ***Eunyssobia echidna*** Lec.—Proc. Am. Phil. Soc., XV, p. 320 (*Euchætes*).

Oval, convex, very uneven, black, the antennæ brown; slender portion of the beak rufous; body extremely densely clothed throughout with a crust of large, closely adherent, scale-like plates, variegated white, brown and blackish in color and sparsely clothed with very long, stiff and erect spiniform bristles. Beak three-fourths



as long as the body in the female, sensibly shorter but otherwise entirely similar in the male, very slender, cylindrical, glabrous, shining, sparsely punctured in even series, evenly and strongly arcuate from the antennæ to the apex, but abruptly, strongly inflated, thickened but straight in lateral profile, spinose and very densely covered with a rough crust of scales from that point to the base; antennæ slender, the scape short, the basal joint of the funicle subequal to the next two; club moderate, oval, densely pubescent and without distinct sutures. Prothorax much wider than long, very strongly constricted and tubulate at apex, the base twice as wide as the apex, transverse but deeply sinuate at each side of the lobe, which is abrupt, prominent and rounded, its surface with a dorsal impression receiving the scutellum; disk uneven, a large shallow impression on each side of the median line, behind the middle, especially obvious. Scutellum moderate, slightly tumid, oval, ogival behind, anteriorly prominent in the middle of the sinuation which receives the thoracic lobe and slipping partially over the surface of the latter. Elytra barely as long as wide, distinctly wider and two-thirds longer than the prothorax, the sides rapidly convergent and broadly evenly arcuate from base to apex, the latter very narrowly rounded, ogival, with a small sutural notch; striæ indicated only by very fine partings of the crust. Under surface and legs densely clothed with a squamose crust of cinereous scales and with short sparse erect and stiff setæ. Length 2.6–3.2 mm.; width 1.3–1.6 mm.

Ohio, Kentucky and Iowa, apparently not rare and said to depredate upon the hickory; its habits are probably quite similar to those of *Balaninus*. It should be remarked that in some species of *Centrinus*, such as *hospes*, the beak is strongly inflated behind the antennæ, especially in the female and probably from causes similar to those which have produced the inflation here; but in *Eunyssobia* it does not appear to be at all sexual in character, and, in the species of *Centrinus*, the antennæ are not inferior in insertion, although in *hospes* they are inserted very near the lower margin, the scrobes being broad and entirely inferior.

#### **PLOCAMUS.**

LeConte—Proc. Am. Phil. Soc., XV, p. 320.

The single small species forming the type of this genus is unmistakably allied to *Eunyssobia echidna*, but differs in several peculi-

arities of indubitable generic import. The principal of these are the shorter beak, which is gradually stout and conical near the base and not abruptly inflated, the channel beneath being broad, shallow, and serving as a partial shelter for the antennal scape, the absence of any trace of the transverse basal constriction, and the shorter second joint of the antennal funicle. The mandibles are entirely similar, but the trophi, and especially the maxillary palpi, seem to be larger and better developed, and the tarsi are shorter, particularly the second joint, which is but slightly longer and scarcely at all narrower than the third, the fourth being nearly as long as the first three together.

1 **Plocamus hispidulus** Lec.—Proc. Am. Phil. Soc., XV, p. 320.

Oblong-oval, moderately convex, black, the beak rufous; antennæ brown; integuments densely clothed with large contiguous squamiform plates, variegated with white, brown, and piceous, a transverse spot of the latter color just behind the middle of the elytra especially noticeable; under surface white; erect dorsal bristles very short and sparse. Beak but slightly longer than the head and prothorax, slender, arcuate, glabrous, linearly punctated and finely bicarinate beneath from the antennæ to the apex, but rapidly and conically robust thence to the base, the basal portion densely clothed with large rough concave and squamiform plates; antennæ inserted at basal fourth on the under surface, the scape short, attaining the head, the basal joint of the funicle slightly longer than the next two, second one-half longer than the third, seventh obconical, nearly as long as the fifth and sixth, club small, slender, not abrupt, oval, compressed, sparsely pubescent on the inner, densely on the outer side, devoid of sutures but with a small terminal button. Prothorax small, transverse, constricted and tubulate at apex, rather distinctly and densely punctate. Scutellum distinct, white, oval. Elytra abruptly much wider than the prothorax, more than twice as long as the latter, the sides subparallel toward base, gradually, broadly and obtusely rounded behind, with a minute and feeble sutural notch; striæ evident only as very fine partings of the crust. Prosternum large, not in the least impressed, separating the coxæ by not quite twice their own width and evenly, transversely constricted behind the apex. Length 1.9–2.2 mm.; width 0.8–1.0 mm.

Maryland. This species has been taken also by Mr. Ulke in the District of Columbia.

## ADDENDA.

## I.

It is to be regretted that a number of species, described by the older writers, continue to remain unknown, and that it will be forever impossible to surely identify them, because of the neglect on the part of their several authors to record structural characters, which might enable us to form an opinion concerning their proper generic positions. These species are the following:—

1 **Baridius anthracinus** Boh.—Sch. Curc., III, p. 727.

The depressed form may indicate a close relationship with *Limnobaris*, as before remarked (p. 554), but I do not know any species with decidedly transverse interstitial punctuation; perhaps, like *crenatus*, the references to which are similar in the Munich Catalogue, it may be Mexican and not an inhabitant of the United States.

2 **Baridius californicus** Mots.—Bull. Mosc., 1845, II, p. 372.

May possibly be the species subsequently described by LeConte under the name *Centrinus nasutus*. At any rate it might for the present be appropriately assigned to *Limnobaris*.

3 **Baridius californicus** Boh.—Eug. Res., Ins., 1859, p. 137.

This is probably a species of *Baris*, allied to *rubripes*, but having the beak longer and the elytral intervals smooth, or it may possibly be *Onychobaris seriata*. It is said to have been taken near San Francisco.

4 **Baridius confertus** Boh.—Sch. Curc., III, p. 728.

Described from Florida. It may be assigned at present to *Onychobaris*, although I have never seen a representative of that genus from the Atlantic regions.

5 **Centrinus dilectus** Harris—Trans. Hart. Soc. Nat. Hist., 1836, p. 79.

The description enables us to assign this species to *Centrinus* without much doubt, and it may possibly be a large female example of one of the densely squamose variations of *Centrinus salebrosus*. The locality is not recorded.

6 **Centrinus pistor** Germ.—Sch. Curc., III, p. 170.

I can add nothing to the remarks made by LeConte (Proc. Am. Phil. Soc., XV, p. 433), except to suggest that this also may be the female of *Centrinus salebrosus*, or of a species closely allied.

## II.

**Baris scolopacea** Germ.—This species, introduced from Europe, may be known by its elongate-oval, convex form and dense but uneven vestiture of white and brown scales, of which a subsutural white spot at the middle of each elytron is especially conspicuous. I have seen several specimens taken near Philadelphia.

*Scolopacea* may be attached provisionally to *Baris*, but the long beak, separated from the head by a fine deep abrupt groove, and the

scaly vestiture, would necessitate its removal from the genus if studied with reference to the homologies of the American series of genera. The European species of Barini are more difficult to treat generically than our own. Some of them, such as *schwarzenbergi*, *limbata*, *artemisiæ*, *atronitens*, *carbonaria*, *chlorizans*, and other similar forms, seem to be consistent with our conception of Baris, but there are many aberrant types, having the beak longer or separated from the head by a deep abrupt groove, or with the third tarsal joint undilated, the body covered with a waterproof coating of scales, or the tarsal claws subconnate at base, such as *spoliata*, *loricata*, *convexicollis*, *picturata*, *sellata* and *nitens*, which cannot be retained in Baris proper, and yet the structural differences do not appear to be great. In judging genera in this tribe, especially among the European representatives, much dependence will have to be placed upon that summation of minor characters known as "habitus", and, if with this difference of facies we can perceive some real structural peculiarity, a study of the European species in connection with our own seems to show that it will eventually have to be accepted as a generic criterion. There is no other way in which the old and new world species can be consistently arranged in homogeneous succession from a generic standpoint.

### III.

The measurements of length throughout the present paper include the entire body and head, but exclude the beak as usual.

## CALANDRIDÆ.

### CALANDRINÆ.

### CACTOPHAGUS Lec.

This is a very well defined and somewhat isolated genus, distinguishable from Sphenophorus by the larger smoother body, cylindrical uncompressed beak and several other characters. It will include a number of species inhabiting northern Mexico and the regions adjacent. Our species are entirely black, but there are several before me from Mexico, in which each elytron has a sub-basal and subapical crimson fascia. The two species which are at once distinguishable among the Arizonian specimens in my cabinet, may be described as follows:—



Body densely dull and velvety-black above, not in the least shining, the pronotum not transversely grooved at base; elytral striæ but just visibly coarser near the base, very finely, remotely punctate throughout, the punctures only slightly less minute laterally. Length 22.0 mm.; width 8.7 mm..... **validus** Lec.

Body less dull, alutaceous, not at all velvety, the head and beak polished; punctures throughout larger and deeper; pronotum with a deep entire transverse groove before the basal margin; elytral striæ fine but very deep, much coarser and more strongly punctate toward base, distinctly and less remotely punctate throughout, the punctures distinct by unaided vision laterally and toward base; elytra relatively less elongate. Length 18.0–19.5 mm.; width 7.0–8.0 mm. Arizona. Three specimens.

**subnitens** n. sp.

*Subnitens* is not to be confounded with the individual variation described by Dr. LeConte under the name *procerus*, the latter is dull, opaque and velvety-black like the typical forms of *validus*.

The dull lustre in this genus is caused, not by granuliform reticulations, but by a beautifully regular system of extremely minute, subcontiguous but not in the least confluent punctures, which are deep and with the edges abrupt. In *validus* these minute punctures are finer and deeper than in *subnitens*; in the latter each of the fine sparse punctures of the intervals is surrounded by a polished ring, caused by an obliteration of the minute ground-sculpture, while in *validus* these areolæ do not exist.

#### CALANDRA Clairv.

It is possible that this genus may have originated in the hypothetical continent, represented at present by a few islands extending from Ceylon to Madagascar; several species are, however, now endemic in the East Indies and one or two perhaps on the west coast of South America. From these regions a number of species have been distributed throughout the world in various kinds of grain. It is quite impossible, therefore, to be sure of the native country of any unfamiliar forms which may occur among us, and, perhaps because of this uncertainty, the genus as a whole has been neglected of late by systematic writers.

In arranging the numerous examples in my cabinet I find four widely distinct species and two subspecies. The true species, one of which it is impossible to identify from published descriptions, may be characterized as follows:—

Elytra with impressed and feebly punctate sulci, the intervals smooth and alternately wider and more elevated especially toward base; pronotum with coarse sparse and elongate punctures.....**granaria**

Elytra with contiguous double series of coarse deep punctures, the double series separated by narrow uniseriately punctate intervals.

Pronotal punctures fine even and distinctly separated, the surface smooth and unusually convex.....**linearis**

Pronotal punctures rather coarse, deep, very dense especially toward the sides, rounded and not elongate, the surface rather depressed on the disk.

**oryzæ**

Pronotal sculpture extremely coarse deep and dense, consisting of long sinuous anastomosing and obscurely punctate rugæ, with a narrow but entire subcariniform median line; elytral sculpture exceedingly deep and dense.....**rugicollis**

**C. granaria** Linn.—Syst. Nat., Ed. X, p. 378; *remotepunctata* Gyll.: Sch. Curc., IV, p. 979.

The differences given by Gyllenhal to distinguish *remotepunctata* are apparently not sufficient, for, color being of little or no value, the only character given to distinguish it is the slightly greater distinctness of the striae punctures toward the suture and of the punctured series of the sutural interval. Length 3.3–4.0 mm.; width 1.1–1.3 mm.

Distributed throughout the United States.

**C. linearis** Hbst.—Käf., VII, p. 5, t. 100, f. 1.

Described from the West Indies but occurring at times in the Atlantic States. It may always be known by the fine even punctation of the pronotum. Length 3.3–3.8 mm.; width 1.1–1.15 mm.

Probably a native of India, from which region a variety is noted in the Munich Catalogue.

**C. oryzæ** Linn.—Amœn. Ac., VI, 1763, p. 395.

The typical form of this cosmopolitan species is perhaps the smallest member of the genus. It somewhat resembles the two previous species in outline, but is very densely punctured on the pronotum, the punctures much coarser than in *linearis* and not elongated as in *granaria*. A series of eleven specimens of what may be regarded as the typical form, give the length 2.1–2.8 mm. and width 0.75–1.0 mm.

Var. **zea-mais** Mots.—Etud. Ent., IV, 1855, p. 77.

Similar in every appreciable detail of structure to *oryzæ*, but always larger and especially stouter. A series of eight specimens

from Texas (Austin) and Florida give the following dimensions. Length 3.2–3.4 mm.; width 1.1–1.25 mm.

Another variety is represented before me by two specimens from Guerrero, Mexico, which are of about the same size as *zea-mais*, but more coarsely and densely punctate, and more opaque, with the elytral punctures more quadrate.

**C. rugicollis** n. sp.—Oval, moderately stout, rather flattened above, dull, very sparsely clothed with short erect yellowish setæ, forming single series on the alternate elytral intervals. *Head* deeply but not coarsely, rather sparsely punctate, with a large deep fovea between the eyes; beak in the female slender, feebly arcuate, smooth, minutely sparsely and subseriately punctate, fully as long as the prothorax, abruptly and angularly dilated, duller and coarsely, seriately punctate near the base; antennæ inserted at basal sixth, slender, the second funicular joint obconical and one-half longer than the third. *Prothorax* barely as long as wide, the sides rather strongly convergent from near the base, rounded at base, deeply, tubularly constricted at apex, the latter fully one-half as wide as the base; disk deeply, rugosely punctate. *Scutellum* dull, impressed. *Elytra* at the humeri exactly equal in width to the disk of the prothorax, two-fifths longer, the sides strongly convergent throughout and nearly straight; apex conjointly rather narrowly rounded; disk with contiguous series of very coarse, quadrate, closely crowded punctures, alternately separated by narrow flat intervals, each of which is coarsely, uniseriately punctate, the punctures oval and almost contiguous. *Pygidium* and under surface coarsely deeply and densely punctate. Length 4.0 mm.; width 1.5 mm.

Florida.

A single specimen, taken by Mr. F. Kinzel in the southern part of the State and presented to me by Mr. W. Jülich. This species is undoubtedly allied to the African *rugosus* Thunb., but differs according to the description of Schöenherr, in its much shorter, non-canaliculate prothorax, and its more strongly and closely punctate abdomen. *Rugicollis* is brownish-black in color, the elytra each clouded feebly with rufous along the middle. The base of the prothorax is transverse and perfectly straight. In *rugosus* the prothorax is said to be one-half longer than its basal width.

#### RHININÆ.

#### YUCCABORUS Lec.

This singular genus is unmistakably allied to Rhina, being in fact nearly identical in rostral structure, but differs in many important features, among which may be mentioned the widely separated

eyes, much more abbreviated, dilated and semi-corneous antennal club, deflexed beak, short legs, and smaller size of the body. The three species before me may be easily separated as follows:—

Piceous-brown, the punctuation of the upper surface finer and more remote.

Body narrowly cylindrical, the elytra more than twice as long as wide; punctures of the elytral series becoming very fine and feeble in apical half, the fifth and sixth series coalescent at base; humeri tumid and prominent.....**frontalis**

Body much more robust, the elytra not quite twice as long as wide; punctures of the elytral series deep throughout, although small in apical half as usual; fifth and sixth series widely separated at base; humeri not tumid.....**sharpi**

Black, much larger, coarsely and deeply sculptured; legs and tarsi stouter.  
**grossus**

**Y. frontalis** Lec.—Trans. Am. Ent. Soc., 1874, p. 70 (Rhina).

Readily distinguishable by its slender cylindrical form and castaneous color. The prothorax is very nearly as long as wide, the sides broadly, evenly arcuate, the apex finely and deeply constricted, three-fourths as wide as the base, the latter broadly evenly and just visibly arcuate. Elytra but slightly wider than the prothorax and much more than twice as long, strongly alutaceous especially behind, the series feebly impressed, the intervals toward base three to four times as wide as the stria punctures, sparsely punctured. Length 9.8 mm.; width 3.2 mm.

Southern California. Found under the bark of *Yucca* in the Mohave Desert.

**Y. sharpi** n. sp.—Moderately stout, cylindrically convex, dark chestnut-brown, polished and glabrous throughout, the elytra but faintly alutaceous behind. Head convex, polished, strongly but remotely punctate; eyes very remote above, contiguous beneath; beak in the male straight, wider than thick, parallel, coarsely deeply and rugosely punctate, feebly dilated at the antennæ, barely three-fourths as long as the prothorax; antennæ inserted just beyond the middle, the scape thick, attaining the eye, second funicular joint longer than the first and as long as the next two, club oval, compressed, as long as the four preceding joints, the polished corneous part extending, on the flat side, to apical third. Prothorax about as long as wide; sides evenly, broadly arcuate; apex finely constricted, three-fourths as wide as the base; punctures coarse, perforate, remote, close on the flanks. Scutellum small, polished. Elytra one-third wider than the prothorax, more than twice as long, the punctured series strongly impressed toward base; interstitial punctures remote, confused but forming nearly even single series on the narrower intervals. Length 9.7 mm.; width 3.7 mm.



Mexico (Guerrero). Mr. Baron.

Allied to *frontalis* but distinguishable by its stouter form, more polished integuments, much less prominent humeri and several other characters. I take great pleasure in dedicating this species to Dr. D. Sharp.

**Y. grossus** n. sp.—Oblong, subcylindrical, broadly feebly convex above, deep black, polished, the elytra dull. *Head* coarsely, rather sparsely punctate; beak in the male straight, wider than thick, coarsely, densely, rugosely punctate, feebly dilated and tumid at the antennæ, thence feebly and evenly narrowed to the apex, two-thirds as long as the prothorax; antennæ inserted distinctly beyond the middle, the scape rather long, thick, evenly and gradually claviform, attaining the eye, second funicular joint much longer than the first, equal to the next two, four to six transversely subeuneate, club nearly as long as the preceding four joints, the corneous portion extending on the flat side to apical two-fifths. *Prothorax* about as long as wide, the apex constricted, two-thirds as wide as the base; sides broadly arcuate; disk evenly convex, very coarsely perforato-punctate, the punctures well separated above, coalescent on the flanks. *Elytra* one-third wider than the prothorax and more than twice as long, not quite twice as long as wide; stria punctures deep, coarse, contiguous, continuing large and distinct to the apex; intervals toward base two to three times as wide as the striae, coarsely, unevenly, sparsely punctate, anterior tibiae broadly, feebly arcuate toward apex, having an internal series of small denticles. Length 11.5–14.0 mm.; width 4.2–5.2 mm.

Texas (El Paso); Arizona. Mr. G. W. Dunn.

The largest species which I have seen and quite distinct from either *frontalis* or *sharpi*.

#### COSSONINÆ.

#### **METOPOTOMA** n. gen.

The single species is an interesting addition to the anomalous group of genera allied to *Gononotus*.

Body in form and convexity nearly as in *Gononotus*. Head short, subglobular, smooth and polished, deeply, transversely incised throughout just behind the eyes, which are situated at the sides of the beak at base, rather large, distinctly convex and composed of very large facets, which are flat and not convex. Beak rather long, thick, parallel and arcuate, the antennal scrobes rapidly descending at first, becoming completely inferior, not coalescent. Antennæ subcylindrical, long but thick, inserted at apical two-fifths, the scape clavate, attaining the limits of the eye beneath, longer than the apparent funicle, the latter consisting of six joints, the first scarcely more robust, oval, the second oboconical, subelongate, much longer than the first and one-half longer than the third, three to six subequal, wider than long, paral-

lel-sided, not increasing much in thickness, with the articulations deep; club large, as long as the preceding five joints, complex in structure, the basal half, composed of the modified seventh funicular joint, obconical, as long as wide, polished and sparsely setose, the apical paler, oval, obtuse, densely pubescent and indistinctly annulate. Scutellum small but distinct. Metasternum short. Anterior coxæ large, globular, extremely approximate; intermediate very narrowly separated; posterior rather remote. Legs somewhat long and thick: femora sinuate beneath near the apex; tibiæ subparallel, the apical uncus well developed, the anterior also with an internal subapical tooth; tarsi cylindrical, rather stout, the third joint scarcely visibly thicker and sparsely setose beneath, not bilobed.

From *Gononotus* this genus differs in its composite antennal club, undilated third tarsal joint, elongate prothorax, smooth, polished head and many other characters.

**M. repens** n. sp.—Elongate-ovoidal, convex, dull, black and subglabrous, each large fovea, however, with a small fulvous seta; there are also a few clusters of such setæ on the more tumid portions of the elytral intervals. *Head* glabrous; beak not quite as long as the prothorax, dull, with coarse shallow punctures, sublinearly arranged but becoming finer and irregular toward apex. *Prothorax* quite distinctly longer than wide, the sides parallel, broadly feebly and evenly arcuate, rather abruptly rounded and moderately deeply constricted behind the apex, the latter three-fourths as wide as the base and broadly sinuate in the middle; base broadly feebly and evenly arcuate; disk evenly, feebly convex, very coarsely, remotely foveate, the foveæ shallow, rounded, and annulate just within their edges with fine cinereous tomentum; median line finely and strongly carinate, the carina attaining neither base nor apex. *Elytra* oval, at the middle one-half wider than the prothorax, not quite twice as long as the latter; humeri obsolete; base broadly emarginate; disk with series of very large deep and unevenly impressed foveæ, the intervals uneven, not wider than the series and remotely, feebly tumorose, the tumid parts setose and also finely cinereo-tomentose. Under surface coarsely, remotely foveate, the foveæ shallow. Length 5.2 mm.; width 2.0 mm.

California (Humboldt Co.).

I took the type specimen in some loose mossy turf, covering the gravelly slopes of a shallow ravine near the town of Arcata; its sex is not apparent. This is one of the largest cossonides in our fauna excluding the genus *Cossonus*.

#### **HIMATIUM** Woll.

There is some doubt concerning the actual identity of Wollaston's genus with the species assigned to it by LeConte. According to the description, however, it must be very closely allied to

our representatives, to such a degree indeed that these could not be advantageously separated without inspecting the original type.

As represented by *nigritulum*, the genus has the body rather depressed above, feebly cuneiform, with the head short and almost entirely enclosed within a subtubulate extension of the prothorax, the eyes small, flat, coarsely faceted and in great part inferior, not visible from above but widely separated beneath. Beak short but slender, feebly arcuate, parallel, inserted at an angle with the surface of the front, so that it is distinctly separated from and very much narrower than the head. Antennæ inserted quite distinctly behind the middle, the scrobes nearly horizontal, not attaining but directed upon the eye; scape short, clavate; funicle slender, 7-jointed, the basal joint rather longer than the next two; second to seventh feebly increasing in thickness, equal in length, subquadrate; club as long as the preceding four joints, narrowly fusiform, polished, sparsely setose, not annulate. Scutellum distinct. Prosternum flat; anterior coxæ remote, separated by fully their own width; intermediate one-half more widely separated. Metasternum long. Legs short, slender; tibiæ without internal spur, the uncus well developed; tarsi short, the third joint feebly dilated, the fourth about as long as the preceding three combined.

The three species, which it is necessary to include at present within the genus, may be recognized as follows:—

Prothorax truncate laterally at apex, remote from the eyes.

Body parallel, ferruginous, densely but coarsely pubescent, the pronotum coarsely, subconfluently punctate, the elytral series coarse and approximate.....**errans**

Body subcuneate, more convex, black, much less pubescent, the pronotal punctures much smaller, distinctly defined; elytral series not impressed, the intervals wide.....**nigritulum**

Prothorax partially concealing the eyes at the sides: beak not distinctly separated from the head by a transverse impression.....**conicum**

*H. conicum* must certainly constitute a genus distinct from that including *errans*, if the characters given by LeConte are correct (Trans. Am. Ent. Soc., VIII, p. 218), and the probabilities are that each of these species will ultimately become the type of a distinct genus.

**H. nigritulum** n. sp.—Black, the elytra somewhat shining, legs, antennæ and apical parts of the prothorax piceous-brown, vestiture very sparse, consisting of erect setiform scales, especially visible on the beak and toward

the elytral apex. *Head* smooth, vaguely sculptured, polished; beak three-fourths as long as the prothorax, opaque, finely but deeply, rugosely and very densely sculptured. *Prothorax* conical, a little longer than wide, constricted behind the apex, the apical tubulation feebly inflated, receiving the head; apex three-fourths as wide as the base; punctures moderately coarse, deep, rounded but subcontiguous, without median line. *Elytra* slightly wider behind the middle than at base, nearly two-thirds wider than the prothorax and more than twice as long; sides feebly arcuate, abruptly convergent and sinuate near the apex; humeri broadly exposed but rather obtuse; disk with unimpressed series of moderately large deep oblong and almost contiguous punctures; intervals flat, a little wider than the serial punctures, feebly rugose but shining. Under surface densely deeply and rather coarsely punctate. Length 1.75 mm.; width 0.6 mm.

Florida.

A single specimen without more precise indication of locality.

#### ALLOMIMUS Lec.

In this genus the beak is rather thin or but moderately stout, nearly straight, parallel, not conspicuously separated from the front, the eyes moderate in size, rather convex, not very finely faceted and situated at the sides of the head, the antennal scrobes deep, sublinear, directed feebly downward to the lower limit of the eye, the funicle 7-jointed, with the basal joint larger, the second obconical and distinctly longer than the third. Our two species differ greatly in structure and should perhaps be assigned to separate subgenera; they may be defined as follows:—

Beak thinner, a little more than one-half as long as the prothorax; anterior coxæ larger, separated by their own width; elytra deeply striate, the sulci coarsely punctate, the sutural sulcus much less distinctly so.

#### **dubius** Horn

Beak shorter and stouter, scarcely one-half as long as the prothorax; pronotal punctures smaller and closer; elytra feebly sulcate and much less coarsely punctate, the punctures of the sutural stria as distinct as the others; anterior coxæ much smaller and more remote, separated by nearly twice their own width. Head polished, almost impunctate, separated from the beak by a feeble transverse impression, the beak throughout coarsely deeply and subrugosely punctate. Prothorax about as long as wide, subconical, feebly depressed above, slightly constricted behind the apex, the latter barely two-thirds as wide as the base. Scutellum distinct. Elytra a little wider than the prothorax and about twice as long, parallel, the sides convergent and nearly straight in apical third, the apex narrowly rounded. Abdomen deeply but not very densely and somewhat unevenly punctate. Length 1.9 mm.; width 0.65 mm. Texas (Columbus and Austin).....**politus** n. sp.



*Politus* is slightly smaller, relatively broader and more depressed than *dubius*, and may be known at once by the shorter beak, finer, more even sculpture, paler color and smaller, much more remote anterior coxæ.

**STENANCYLUS** n. gen.

The principal characters may be expressed as follows:—

Body elongate, slender, convex, the scutellum distinct, the metasternum elongate and the anterior coxæ widely separated. Head rather elongate, conical; beak short, broad, parallel, not in the least constricted or transversely impressed at base. Antennæ inserted behind the middle, the scrobes deep, beginning beyond the middle, rapidly descending to the lower margin of the eye; scape moderate in length; funicle 7-jointed, the basal joint rather stout, as long as the next two; second to seventh rather short, subequal, feebly increasing in width, just visibly obconical; club moderate, oval, densely but coarsely pubescent, with the basal joint constituting about one-half of the mass. Eyes not very large, situated at the sides of the head, very convex, prominent and coarsely faceted. Legs short; tibiæ rather slender, with a small internal spur at apex, the external uncus well developed; tarsi rather stout, the third joint feebly dilated, fourth slender, arcuate, not quite as long as the three preceding together.

This genus is allied to *Macrancylus*, but differs in its rather stouter, more elliptic body and radically in its oblique and not horizontal scrobes, also in its more prominent and coarsely faceted eyes, and parallel beak; in *Macrancylus* the beak is conical in form. From *Rhyncolus* it may be known at once by its more widely separated coxæ and coarsely faceted eyes, as well as its more slender bodily form.

**S. colomboi** n. sp.—Elongate, narrowly oval, cylindrically convex, glabrous, polished and pale rufo-piceous throughout. Head and beak continuous, transversely convex, finely but strongly, not very densely punctate, the eyes situated at a great distance from the prothorax; beak scarcely as long as the head and two-fifths as long as the prothorax, straight. Prothorax a little longer than wide, broadly, very feebly constricted near the apex, the sides feebly arcuate; apex slightly arcuate, three-fourths as wide as the base; punctures rather fine but strong, uneven but separated by about their own widths without trace of median line. Scutellum small, oval. Elytra distinctly wider than the prothorax and more than twice as long, twice as long as wide, the sides parallel and straight to apical third, then convergent and sinuate, the apex narrowly obtuse; humeri right; striæ coarsely feebly impressed, coarsely punctate; intervals narrow, finely, uniseriately punctate. Under surface coarsely but not very densely punctate. Length 2.2–2.4 mm.; width 0.6 mm.

Florida (Biscayne Bay and Cape Jupiter). Mr. Schwarz.

I have dedicated this species to the memory of the distinguished navigator Cristoforo Colombo.

### CARPHONOTUS n. gen.

A single species, boreal in habitat and partially pubescent, possesses several peculiarities of structure which appear to prevent its assignment to any of the described genera.

Body moderately stout, somewhat depressed above, the elytra parallel, much wider than the prothorax; scutellum distinct, flat, ogival. Head short, the beak straight, moderately short, parallel, not separated from the head by a transverse impression. Antennæ inserted a little beyond the middle, the scrobes deep, obliquely descending beneath the eye; scape moderate; funicle 7-jointed, the basal joint stout, as long as the next two; second to seventh equal in length, but slightly wider than long, gradually a little thicker; club abrupt, moderate in size, the basal joint large, polished, sparsely setose. Eyes on the sides of the head at their own length from the prothorax, not very finely faceted, somewhat convex and prominent, transversely oval. Prosternum separating the large anterior coxæ by one-half of their own width; intermediate coxæ rather more than twice as widely separated as the anterior. Metasternum long. Legs stout; tibiæ parallel, the external uncus well developed but without trace of internal spur at apex; tarsi rather stout, the third joint distinctly dilated and bilobed.

This genus is somewhat allied to *Stenancylus*, but differs in its broader form, relatively narrower prothorax, less prominent, more finely faceted eyes situated much nearer to the anterior margin of the prothorax, shorter head, longer beak with the antennæ inserted beyond the middle, relatively less widely separated anterior coxæ, absence of internal tibial spur, and in the hairy vestiture.

**C. testaceus** n. sp.—Oblong-oval, feebly depressed above, pale rufo testaceous throughout, smooth and polished, the upper surface with short coarse and very sparse, subrecumbent pubescence, becoming erect toward the elytral apices and somewhat bristling on the beak. *Head* and beak minutely but strongly, not very densely punctate, the beak twice as long as the head and three-fifths as long as the prothorax, viewed anteriorly nearly twice as long as wide. *Prothorax* about as long as wide, feebly constricted near the apex; sides subparallel and very slightly arcuate; apex broadly, feebly arcuate and but slightly narrower than the base; punctures rather fine but deep, perforate, somewhat sparse; median line obsolete. *Elytra* one-half wider than the prothorax and two and one-half times as long, twice as long as wide, parallel and straight at the sides, obtusely ogival in scarcely more than apical fourth; humeri right, blunt; disk with entirely unimpressed series of large oblong-

elongate subbilobed punctures; intervals flat, but slightly wider than the serial punctures, each with a single uneven series of minute, feeble punctures. Under surface throughout rather finely but deeply and somewhat densely punctate. Length 2.8 mm.; width 0.9 mm.

Minnesota.

Easily distinguishable from any species of *Rhyncolus* by its depressed form, narrow beak and prothorax, and pubescent surface.

**APOTREPUS** n. gen.

A single species again constitutes a genus which is without any close ally in our fauna.

Body stout, subcylindrical, moderately convex, the elytra wider than the prothorax, the scutellum distinct; upper surface setose. Head short, broad, cono-globose, not conspicuously separated from the beak. Beak rather short, robust, parallel toward base but dilated toward apex. Eyes situated at the sides, partially on the beak, distant from the prothorax, feebly convex and rather prominent, somewhat coarsely faceted. Antennæ inserted at the middle, the scrobes deep, linear, obliquely descending to the lower limit of the eyes; scape robust; funicle long, 7-jointed, the two basal joints equal, each longer than wide and longer than three to seven, which are subequal in length, gradually thicker, obconical, submoniliform, the articulations strongly marked; club oval, densely but coarsely pubescent, abrupt, fully as long as the preceding four joints, not annulate. Anterior coxæ small, remote, separated by fully their own width; intermediate still more widely separated. Metasternum long. Legs rather long but somewhat stout, the tibiæ parallel, with a small internal spur and well-developed external uncus at apex; tarsi rather long, the basal joint nearly as long as the next two, third feebly dilated, fourth but slightly longer than the preceding two combined.

*Apotrepus* is related to *Caulophilus latinasus* perhaps more closely than to any other North American species, resembling it in general form of the body, but differing greatly in its shorter beak dilated near the apex, in its smaller eyes, longer second funicular joint, and in the sparse bristling and setiform vestiture.

**A. densicollis** n. sp.—Black, the antennæ and legs feebly rufescent, rather shining, the setæ short, stiff, erect, forming an uneven single line on each elytral interval. Head very short, finely, sparsely punctate, the beak nearly straight, densely, subrugosely punctate, more than twice as long as the head and separated therefrom only by a very broad transverse impression, from the anterior margin of the eyes to the apex one-half as long as the prothorax, not twice as long as wide viewed anteriorly. Prothorax about as long as wide, broadly, strongly constricted behind the apex, the sides feebly

convergent and distinctly arcuate; apex three-fourths as wide as the base; disk rather coarsely deeply and extremely densely punctate, the punctures polygonally crowded, without median line. *Elytra* one-third to two-fifths wider than the prothorax and rather more than twice as long, two-thirds longer than wide; sides parallel and nearly straight in basal two-thirds, then gradually rounded convergent and sinuate to the apex; humeri right, narrowly rounded; striae coarse, feebly impressed, coarsely deeply and approximately punctate, the intervals about as wide as the striae punctures, scarcely perceptibly punctate. Under surface rather coarsely, densely punctate, the abdomen more finely and sparsely so. Length 2.8–3.0 mm.; width 1.0 mm.

Arizona. Two specimens.

### **PSEUDOPENTARTHURUM** Woll.

This genus was founded by Wollaston upon a small species from Mexico, resembling *Phloeophagus*, and with the anterior coxæ approximate as in that genus, but having the antennal funicle 5-jointed. It is distinguished from *Pentarthrum* by its much less distant anterior coxæ and more abbreviated cylindrical form. I now assign to it two other species, having the beak very short, thick but parallel, not constricted at base, though sometimes separated from the head by a broad feeble transverse impression. Eyes moderately developed, feebly convex, finely faceted, situated at the upper part of the sides and conspicuous from above; scrobes horizontal, deep, ending at quite an appreciable distance in front of the eye and there flexed abruptly downward. Antennæ inserted at basal third, thick, the basal joint of the funicle large, two to five transverse, parallel, subequal, closely coarctate, the club continuous with the funicle, and, together with joints two to five, strongly compressed. Scutellum distinct. Metasternum rather long. Anterior coxæ closely approximate. Legs short, robust, the tarsi stout with the third joint but slightly wider than the second, the fourth not as long as the remainder, arcuate and very slender.

*Pseudopentarthrum* differs from *Pentarthrinus* in its shorter, more parallel form, relatively larger prothorax, in the greater distance between the antennal scrobes and the eye, in the more compact and compressed antennæ, with the club not abrupt, and in its stouter legs. The species may be separated by the following characters:—

Beak not separated from the head by a pronounced transverse impression;  
larger species, the pronotum highly polished.....**robustum**



Beak separated by a broad transverse impression; head and basal parts of the beak finely, remotely punctate, the remainder of the beak densely so; pronotum dull ..... **simplex**

**P. robustum** n. sp.—Robust, cylindrical, the elytra perfectly parallel and a little wider than the prothorax, polished, black and glabrous throughout. *Head* rather finely but deeply, not densely punctate; beak thick, finely punctate, not separated from the head by a transverse impression, two-fifths as long as the prothorax; scrobes not extending to the eye, rectangular; antennæ inserted at basal third, first funicular joint large, wider than long, rather longer than the next two, second concealed partly within the apex of the first, apparently shorter than the third, two to five coarctate, forming a thick compressed mass, the club scarcely at all wider or thicker and forming nearly a prolongation of the funicle. *Prothorax* about as long as wide, broadly rounded on the sides, constricted behind the apex, the latter three-fourths as wide as the base; punctures coarse, deep, perforate, separated by about one-half of their own diameters, with a polished impunctate central spot. *Scutellum* rounded, slightly tumid. *Elytra* one-half longer than wide; striæ deeply impressed, coarsely deeply and closely punctate; intervals two to three times as wide as the stria punctures, convex. Under surface coarsely, closely punctate, the abdomen more sparsely so, and more finely, except at base. Length 3.7 mm.; width 1.3 mm.

Texas (Austin).

The single specimen is of undetermined sex.

**P. simplex** n. sp.—Cylindrical, moderately stout, black, glabrous, the pronotum subalutaceous. *Head* very finely, sparsely punctate; beak finely, closely punctate except toward base, separated from the head by a rather deep wide transverse impression, which is very sparsely punctate and minutely, obsoletely foveolate, thick, parallel, as long as the head, not one-half as long as the prothorax; scrobes deep, rectangular, not attaining the eye by a very noticeable distance; antennæ inserted near basal third, nearly as in *robustum*, but with the joints much less transverse. *Prothorax* nearly as long as wide, feebly constricted behind the apex, the latter broadly arcuate and nearly four-fifths as wide as the base; sides feebly arcuate; punctures coarse, deep, separated by much less than their own widths, without median impunctate area. *Elytra* parallel, barely three-fifths longer than wide, nearly twice as long as the prothorax and slightly wider; striæ deeply impressed, coarsely, deeply but not very closely punctate; intervals convex, finely, sparsely, subseriately punctate, twice as wide as the stria punctures. Under surface not coarsely but strongly, rather sparsely punctate throughout. Length 2.5 mm.; width 0.95 mm.

Nebraska.

Allied to *robustum* but differing in its smaller size, dull and not polished pronotum, relatively longer elytra with narrower intervals, different structure and sculpture of the beak and antennæ, and in many other features.

**PENTARTHINUS** n. gen.

I refer to this genus several species which have been previously assigned to *Amaurorhinus* Fairm. *Amaurorhinus*, according to Wollaston, has the scutellum obsolete, the eyes rudimentary or obsolete, the elytra oval or fusiform, the antennæ inserted far beyond the middle of the beak, and the metasternum short, all of which characters are at variance with the species under consideration. As represented by the four species in my cabinet, *Pentarthrinus* may be known by the following characters:—

Body feebly subcuneiform, moderately convex, polished and glabrous, with the scutellum distinct, metasternum elongate, anterior coxæ approximate, and the intermediate separated by much less than their own width. Beak very short, thick, parallel, longitudinally convex, separated from the head by a very broad transverse impression. Eyes well developed, moderately convex, at the sides of the head, distant from the prothorax and finely faceted. Antennæ inserted at basal third, in deep wide scrobes which are horizontal nearly to the margin of the eye, then dilated or flexed downward; scape short, thick; funicle 5-jointed, the basal joint large, the others subequal in length, obconical, wider than long, the articulations distinct; club abrupt. Legs short and slender, the tarsi slender with the third joint but slightly dilated.

*Pentarthrinus* is quite closely related to *Pentarthrum* and *Pseudopentarthrum*, but differs from the former in the more approximate anterior coxæ, and from the latter in the abrupt antennal club. The species may be separated as follows:—

Anterior coxæ extremely approximate but not in actual contact; beak not impressed in basal half.

Pronotum rather coarsely deeply and conspicuously punctate, with the interspaces highly polished.

Elytral intervals twice as wide as the striæ, flat, minutely, very sparsely and somewhat confusedly punctate in single series ..... **nitens**

Elytral intervals narrow, not wider than the striæ, each with a single series of fine but distinct punctures, more or less confused on the sutural interval; prothorax small ..... **parvicollis**

Pronotum slightly alutaceous, sparsely, less deeply and much more finely punctate; elytral intervals narrow, polished, strongly convex, with the punctures of the single series remote, excessively minute and scarcely discernable ..... **piceus**

Anterior coxæ narrowly though quite perceptibly separated; beak narrowly impressed along the median line in basal half or more ..... **atrolucens**

**P. nitens** Horn—Proc. Am. Phil. Soc., XIII, 1873, p. 434 (*Amaurorhinus*?).

Subcylindrical or feebly cuneate, moderately convex, just visibly wider behind the middle of the elytra, polished, black and glabrous throughout. Head finely, sparsely, the beak equally finely but more

densely, punctate, the latter separated from the head by a broad, shallow transverse impression which is rather deeply foveate in the middle; scrobes deep; antennæ inserted at basal third, the first funicular joint large, the club rather large, compressed, much wider than the outer joints of the funicle, sparsely pubescent. Prothorax scarcely as long as wide, feebly constricted and very briefly sub-tubulate at base; sides feebly convergent and broadly arcuate from near the base, still more convergent but scarcely constricted near the apex, the latter three-fifths as wide as the base; punctures strong, sparse, without distinct median line. Elytra one-fourth wider than the prothorax and two and one-half times as long, constricted near the apex, the striæ feebly impressed, rather coarsely and approximately punctate; intervals wide, flat, fully twice as wide as the striæ, very minutely punctate. Metasternum rather finely but deeply punctate, closely and more coarsely so anteriorly, the abdomen finely and sparsely punctate. Length 3.3 mm.; width 1.2 mm.

Florida. Readily distinguishable from either *parvicollis* or *atro-lucens* by the much broader elytral intervals and the well-marked frontal fovea. The single specimen in my cabinet is considerably larger than the original type as measured by the author.

**P. parvicollis** n. sp.—Rather short and robust, subeuneate, convex, glabrous, polished and black, the legs and antennæ rufous. *Head* minutely, extremely sparsely punctate, the beak throughout more coarsely deeply and closely so, the punctures somewhat uneven; front not in the least foveate; eyes well developed, situated midway between the apex of the prothorax and end of the beak, the latter robust, very short, less than one-half as long as the prothorax, the antennæ inserted at basal third. *Prothorax* small, oval, strongly convex, about as long as wide, the sides evenly and strongly arcuate, a little more convergent anteriorly but not in the least constricted; apex three-fourths as wide as the base; punctures coarse, deep but not dense, somewhat uneven in distribution but generally separated by rather more than their own widths; median line obsolete. *Elytra* two-thirds wider than the prothorax and nearly three times as long, rather short, not twice as long as wide, very slightly wider behind than at base, obtusely ogival but not constricted in apical fourth or more; sides just visibly arcuate; humeri broadly exposed but rounded; striæ feebly impressed, very coarsely but not approximately punctate, the intervals narrow. *Abdomen* finely, sparsely punctate, the metasternum coarsely and more closely so. Length 2.1–2.5 mm.; width 0.8–0.9 mm.

Pennsylvania; Virginia.

This species is easily distinguishable by its rather shorter, broader elytra, small, oval prothorax and very coarse punctuation. My

specimens were labeled *Phlæophagus apionides*, but the latter is evidently a widely different species, with the "lateral striæ entire;" in *P. parvicollis*, the ninth and tenth striæ are united behind the humeri, as in all the species of this genus.<sup>1</sup>

**P. piceus** n. sp.—Cylindro-cuneate, strongly convex, glabrous, piceous, the elytra polished; pronotum feebly alutaceous and minutely reticulate. *Head* and beak minutely and sparsely punctate, the latter parallel, convex, one-half as long as the prothorax, separated from the head by a broad, transverse impression, which is foveate in the middle; scrobes deep, widening behind; antennæ inserted behind the middle, the basal joint of the funicle large, two to five transversely obconical, subequal in length, the second partially concealed within the apex of the first as usual; club rather large, oval, fully as long as the four preceding joints combined. *Prothorax* fully as long as wide, the sides subparallel, broadly arcuate, convergent and very feebly sinuate toward apex, more abruptly rounded convergent and constricted at base, the apex broadly, feebly arcuate, nearly four-fifths as wide as the base; punctures small, sparse, separated by twice their own diameters; median line obsolete. *Elytra* distinctly wider than the prothorax and more than twice as long, gradually slightly wider behind, the sides straight; humeri feebly prominent, narrowly rounded; striæ deeply impressed, rather coarsely but not very closely punctate; intervals narrow, strongly convex, twice as wide as the stria punctures, each with a single series of scarcely perceptible, remote punctures. Under surface finely, sparsely punctate. Length 2.6 mm.; width 0.9 mm.

#### Florida.

One specimen, apparently a female. The head is not much more sparsely punctate than the beak, but is almost impunctate toward base and has a small, feebly impressed frontal fovea. This species may be known at once by its fine punctuation and piceous-brown color.

**P. atrolucens** n. sp.—Narrow, feebly cuneate, strongly convex, polished, black and glabrous throughout, the legs slightly piceous, the apical margin of the prothorax feebly rufescent. *Head* and basal half of the beak finely and very sparsely punctate; beak longitudinally, convex, very short, two fifths as long as the prothorax, narrowly impressed along the middle in basal half, more closely punctate in apical half; antennæ inserted just beyond basal third; eyes rather nearer the prothorax than the tip of the beak. *Prothorax* as long as wide, the sides subparallel and almost straight from before the base nearly to apical third, then more convergent and quite distinctly constricted to the apex, the latter rather narrow, three-fourths as wide as the

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<sup>1</sup> It is probable that *Phlæophagus apionides* Horn, should constitute a new genus, but I cannot distinguish *P. minor* from the true *Rhyncolus*.



basal margin, the latter much narrower than the disk, which is convex, coarsely, deeply but not densely punctate, with a smooth apical margin; median line obsolete. *Elytra* a little wider behind, nearly one-third wider than the prothorax and more than twice as long, three-fourths longer than wide; sides nearly straight, rounded, convergent and feebly constricted in apical third, the apex narrowly subtruncate; striae coarse, feebly impressed, the punctures coarse, rounded but not very close-set; intervals nearly flat, feebly elevated, but slightly wider than the striae punctures, each with a single series of fine but distinct punctures. Metasternum coarsely and closely punctured, the abdomen more finely and sparsely so. Length 2.3–2.6 mm.; width 0.7–0.9 mm.

Florida (Biscayne Bay).

This species differs from *nitens* in its smaller size, narrower form, coarser striae, larger punctures, sculpture of the beak, and rather more widely separated anterior coxae; from *piceus* it may be known at once by its color, more polished surface, and very much more coarsely punctured pronotum. Three specimens.

**NYSSONOTUS** n. gen.

The principal characters distinguishing this pentarthride genus may be stated as follows:—

Body cylindrically convex, deeply and closely sculptured, setose. Beak thick, short, parallel, arcuate toward apex, not separated from the head by a transverse impression. Antennae inserted a little behind the middle, the scrobes deep, beginning beyond the middle, thence straight and feebly descending nearly to the lower limit of the eye, thence abruptly transverse beneath; scape short, as long as the first three joints of the funicle, the latter 5-jointed, the basal joint large, two to five feebly obconical, subequal, a little wider than long; club abrupt, compressed, oval, with the basal joint large. Eyes moderate, rather finely faceted, subdepressed, at the sides of the head and very remotely separated. Scutellum distinct. Metasternum long. Anterior coxae extremely approximate, the intermediate rather widely separated. Legs nearly normal, external tibial uncus well developed, the anterior also with a short internal terminal spur; tarsi short, thick, the third joint slightly dilated, deeply emarginate, the fourth slender, fully as long as the preceding three together.

*Nyssonotus* is closely allied to *Pseudopentarthrum*, but differs in the obliquely descending and not horizontal antennal scrobes, in the longer beak, still more widely separated and lateral eyes, and in the stiff erect and bristling setae.

**N. seriatus** n. sp.—Cylindrical, feebly shining, black, the upper surface throughout with very short erect stiff setae, sparsely placed but forming a

single close-set series on each elytral interval. *Head* and beak strongly, rather closely punctate, convex, without frontal fovea; antennæ feebly rufescent, sparsely setose. *Prothorax* not quite as long as wide, the sides broadly, feebly arcuate, gradually slightly convergent and not constricted to the apex, strongly arcuate near the base, the latter slightly wider than the subtruncate apex; punctures coarse, deep, extremely dense, without median line. *Elytra* parallel and straight at the sides, three-fifths longer than wide, distinctly wider than the prothorax and more than twice as long; humeri right, not prominent, narrowly rounded; apex broadly, evenly parabolic, the sides not constricted; disk with feebly impressed series of coarse, rounded, approximate punctures, the intervals flat, equal in width to the striae punctures, each with a single series of much smaller but strong and conspicuous setiferous punctures. *Abdomen* coarsely, closely and subrugosely punctate, the metasternum more finely but rather densely so. Length 3.0-3.3 mm.; width 1.1 mm.

Texas (El Paso). Mr. G. W. Dunn.

This species somewhat resembles a rather stout *Rhyncolus*, and may be easily identified otherwise by the coarse, dense sculpture, and erect setæ. Three specimens.

#### **RHAMPHOCOLUS** n. gen.

Body narrowly cylindrical, glabrous, shining. Head very short, merging gradually into the beak, the latter short, gradually wider from apex to base, not separated from the head by a transverse impression. Eyes almost flat, but well developed, oval, rather finely faceted, situated at the lower part of the sides of the head, not very distant from the prothorax and but slightly visible from above. Antennæ inserted at basal third, the scrobes narrow, straight, gradually descending and directed upon the middle point of the eye; scape slender, feebly clavate; funicle 7-jointed, the basal joint stouter, as long as the next three, two to seven wider than long, subequal in length, gradually wider, the articulations distinct; club abrupt, moderate in size, oval, annulate toward apex. Anterior coxæ narrowly separated, the intermediate separated by much less than their own width. Metasternum rather long. Legs somewhat short, the femora stout; tibiæ slender, very minutely uncinatè within at apex, the external unguis distinct; tarsi slender, the third joint completely undilated, not at all wider than the second. Scutellum distinct.

The form of the beak and several other structural characters show that *Rhamphocolus* must be associated with *Rhyncolus*, but it differs notably from that genus in its much less convex and more inferior eyes, with the antennal scrobes directed upon them and not below them, in its more slender tarsi and still more approximate anterior coxæ.

**R. tenuis** n. sp.—Narrowly cylindrical, convex, black, the legs and antennæ dark brown; integuments polished and glabrous. *Head* and beak finely, rather sparsely punctate, the latter feebly conical, three-fifths as long as the prothorax, one-half longer than wide. *Prothorax* very nearly as long as wide, broadly, just visibly impressed behind the apex; sides feebly convergent and nearly straight from before the base to the apex, the latter broadly arcuate, subequal in width to the basal margin; punctures coarse, deep, rather close-set and uneven, without median line. *Elytra* but very slightly wider than the prothorax and scarcely more than twice as long, twice as long as wide, the sides parallel and straight nearly to apical fourth, then convergent and nearly straight to the narrowly rounded apex; humeri angulate and somewhat anteriorly prominent; disk with feebly impressed series of coarse deep rounded and close-set punctures, the intervals flat, barely as wide as the striæ, each with a single series of fine but distinct, rather remote punctures. Under surface rather coarsely but feebly and not densely punctate. Length 2.1–2.3 mm.; width 0.6–0.7 mm.

Texas (Austin).

Readily recognizable by its resemblance to an unusually slender *Rhyncolus*.

#### **RHYNCOLUS** Germ.

The species of this genus vary greatly among themselves, especially in the structure of the antennæ and the degree of separation of the anterior coxæ. The following descriptions will indicate some of these discordances.

**R. pallens** n. sp.—Cylindrically convex, shining, pale flavo-ferruginous throughout, the head, beak and apical parts of the prothorax piceous-black. *Head* and beak minutely, the latter rather closely, punctate, impressed along the middle, conical, extremely short, much wider than long and shorter than the head; eyes small, rounded, prominent; antennæ moderate, the scape nearly as long as the funicle, with one or two stiff erect setæ on the under surface, the funicle slender with the second joint obconical, as long as wide and longer than the third, club abrupt, oval, densely pubescent and about as long as the five preceding joints combined. *Prothorax* a little wider than long, feebly constricted behind the apex, the latter as wide as the base; sides feebly convergent from before the base to the apex and nearly straight; disk very finely closely punctate, without entire median line. *Elytra* but slightly wider than the prothorax and more than twice as long, twice as long as wide; sides straight; apex obtusely rounded; disk with almost entirely unimpressed series of fine, rounded, approximate punctures, the series impressed on the apical declivity and the fifth also toward base; intervals flat, minutely punctate in single uneven series, about twice as wide as the serial punctures. Under surface very finely, densely punctate, the abdomen evenly but less densely so, the first suture deep throughout, broadly angulate in the middle. Anterior

coxae separated by nearly one-half of their own width. Length 2.4–3.0 mm.; width 0.75–0.9 mm.

California (San Francisco).

This is the commonest species of the middle coast regions, and is not closely allied to any other. It is represented by a large series.

**R. spretus** n. sp.—Cylindrical, shining, dark rufo-piceous, the occiput, legs and antennal club paler, rufous. *Head* almost impunctate toward base; beak finely but strongly, densely punctate, very short, wider than long, scarcely as long as the head, conical, narrowly impressed along the middle; eyes well developed, moderately prominent; antennae inserted just before the eyes, the scape not quite as long as the funicle, swollen and setose near the middle beneath as in *pallens*, funicle moderately slender, the second joint a little wider than long and but slightly longer than the third, club abrupt, oval, nearly as long as the preceding five joints. *Prothorax* slightly wider than long, the sides very feebly convergent and straight from before the base to the subapical constriction, which is pronounced but not abrupt; apex scarcely as wide as the base; disk very finely, closely punctate, without impunctate line. *Elytra* not distinctly wider than the prothorax and about twice as long, three-fourths longer than wide, parallel and straight at the sides, obtusely rounded at apex, the disk with scarcely at all impressed series of large, shallow, rounded and well separated punctures, the intervals nearly flat, not wider than the striae punctures, each with a single series of minute remote punctures. *Prosternum* finely, densely punctate, the metasternum and abdomen toward base finely but more sparsely so; fifth segment finely, extremely densely punctate and dull. Anterior coxae separated by barely one-fourth of their own width. Length 2.3 mm.; width 0.8 mm.

California.

Related to *angularis* Lec., but with shorter prothorax and elytra, the serial punctures of the latter being larger, more distant and less deeply impressed, the pronotum is much more finely and closely punctate, and the beak is impressed in the middle. The first abdominal suture is deeply impressed and nearly straight. A single specimen.

**R. dilatatus** n. sp.—Cylindrical, robust, polished, dark rufo-piceous, the legs and antennal club paler. *Head* sparsely but strongly, the beak more finely but rather densely, punctate, the latter nearly as long as wide, conical, a little longer than the head, feebly impressed or flattened and less densely punctate along the middle; eyes small, rather feebly convex, situated much nearer the prothorax than the tip of the beak; antennae inserted just behind the middle, the scape long but not quite as long as the funicle, gradually, strongly clavate, funicle cylindrical, the basal joint rather more robust and as long as the next two, second distinctly wider than long and barely longer than the third, club rather abrupt but not longer than the four preceding



joints, oval. *Prothorax* about as long as wide, the sides very feebly convergent and straight from before the base to apical third, then gradually a little more convergent to the apex, which is four-fifths as wide as the base; constriction fine and feeble; disk rather coarsely, very deeply and somewhat unevenly punctate, the punctures separated by about their own diameters, without impunctate line. *Elytra* short, just visibly wider and barely two-thirds longer than the prothorax, one-half longer than wide; sides parallel and straight, the apex semi-circularly rounded; disk with coarse, rather deep, coarsely and profoundly punctate striæ, the intervals narrow but nearly flat, scarcely more than one-half as wide as the striæ, each with a single series of fine remote punctures. Under surface densely punctate, the abdomen more sparsely so, the fifth segment closely. Anterior coxæ large, separated by rather less than one-third of their own width. Length 3.0 mm.; width 1.05 mm.

#### California.

The type to which this isolated species is referable, differs from that of *pallens* and *spretus* very greatly in the antennal scrobes, which, in those species, are basal and nearly transverse; in *dilatatus* they begin near the apex of the somewhat longer beak, descending thence obliquely beneath the eye; the scape, also, is gradually and evenly clavate in *dilatatus*, and not swollen in the middle beneath, and the head is shorter with the eyes less remote from the prothorax. The first ventral suture is deep and straight, the next two extremely coarsely excavated but straight. One specimen.

**R. relictus** n. sp.—Ovo-cylindrical, dark piceous-brown, the tarsi and antennal club paler. Head very minutely, sparsely, the beak more strongly, rather densely, punctate, the latter as long as the head, nearly as long as wide, parallel and straight at the sides and distinctly impressed along the middle; eyes situated nearly midway between the prothorax and tip of the beak; antennæ moderately long, the scrobes narrow, obliquely descending, scape gradually thick and clavate, inserted at basal third, distinctly shorter than the funicle, the latter rather slender, the second joint longer than the third, outer joints thicker, club distinctly wider, oval. *Prothorax* one-third longer than the head and beak, fully as long as wide, widest at basal third where the sides are broadly arcuate, thence feebly convergent and nearly straight to the apex, which is just visibly narrower than the basal margin; constriction feeble; disk finely, not very deeply, somewhat unevenly and not densely punctate, generally with a feebly defined median impunctate spot. *Elytra* one-fifth wider than the prothorax and fully twice as long, not quite twice as long as wide; sides straight and parallel, convergent and constricted in apical third, the apex somewhat produced and narrowly, almost semi-circularly rounded; disk with impressed series of rather large, very deep, well-separated punctures, the intervals feebly convex, barely one-half wider than

the striæ, each with an uneven series of extremely minute distant punctures. Under surface not very coarsely but deeply and densely punctate, the abdomen more sparsely so except on the fifth segment; first suture very fine, broadly curved throughout and just traceable, the other three very coarse and deep anterior coxæ separated by barely one-third of their own width. Length 2.8–3.4 mm.; width 0.8–1.1 mm.

New Mexico.

This species shares to some extent the characters distinguishing both the *pallens* and *oregonensis* types of the genus, having the somewhat longer uncontractile second funicular joint and the oval and wider club of the former, and the fine and feeble first abdominal suture of the latter. In *oregonensis* the club is but very slightly wider than the tip of the funicle, and the eyes are larger, more circular and decidedly nearer the apex of the prothorax. The beak in *relictus* is somewhat aberrant in being parallel and not conical.

**R. nimius** n. sp.—Cylindrical, moderately stout, polished, black throughout, the tarsi and antennal club paler. Head very minutely and sparsely punctate, the beak more coarsely deeply and rather densely so, just visibly and unevenly subimpressed along the middle, conical, about as long as the head and nearly as long as wide; eyes rather large, very convex, finely faceted as usual, situated at a little more than their own length from the prothorax; antennæ short and very thick, aberrant, inserted at basal third, scrobes deep and coarse, beginning at apical third and rapidly obliquely descending, scape short, thick, the funicle very thick, cylindrical and equal in diameter from the second joint to the widest part of the club, the basal joint a little thicker, wider than long, with its apex excavated, the second joint deeply received in the cup-like excavation and having only a very short apical margin exposed beyond it; joints two to seven short, extremely transverse but somewhat compactly perfoliate, each joint being deeply concave at apex; club not in the least wider, scarcely longer than the three preceding joints combined. Prothorax a little longer than wide, the sides broadly, almost evenly arcuate, gradually convergent anteriorly, the constriction distinct; apex broadly arcuate and a little narrower than the base; disk coarsely, deeply but rather sparsely punctate. Elytra not wider than the prothorax and scarcely more than three-fourths longer, not quite twice as long as wide; sides straight, apex broadly, obtusely rounded throughout, not at all constricted; disk coarsely, deeply subsulcate, the grooves coarsely, deeply punctate; intervals about as wide as the sulci, each with a single series of fine remote punctures. Metasternum rather finely but closely punctate, the abdomen but slightly more sparsely so. Anterior coxæ large, separated by scarcely one-fifth of their own width. First ventral suture broadly arcuate, very fine, not impressed. Length 4.7 mm.; width 1.3 mm.

New Mexico (Las Vegas).

The single specimen is probably a male, the abdomen having near the base, an elongate-oval, feeble impression, which is finely, extremely densely punctate and coarsely pubescent. This is one of the largest species of the genus.

**R. discors** n. sp.—Narrowly cylindrical, black and polished; legs and antennæ paler, dark rufo-testaceous. *Head* minutely, remotely punctate toward base, rather longer than the beak, which is feebly conical, densely punctate, not impressed and wider than long; eyes rather small but strongly convex and prominent; antennæ moderately thick, the basal joint of the funicle more robust, excavated at apex and enclosing the second, with the exception of a short apical margin, two to six subequal, strongly transverse, compactly perfoliate, the seventh rather longer and wider, obconical; club wider than any joint of the funicle but not abrupt, oval, with its basal joint composing one-half the mass, polished and sparsely setose, the remainder densely pubescent. *Prothorax* fully as long as wide, the sides very slightly convergent and nearly straight from just before the base to the apex, the constriction fine and very feeble; apex broadly arcuate and about as wide as the base; disk coarsely, deeply, moderately closely punctate, with a wide impunctate spot in basal two-thirds. *Elytra* not distinctly wider than the prothorax and not quite twice as long, scarcely twice as long as wide, the sides straight; apex evenly obtusely and semi-circularly rounded; disk very coarsely, deeply sulcate, the grooves strongly punctate; intervals not quite as wide as the sulci, each with a single series of small, very remote punctures. Under surface rather coarsely deeply and densely punctate, the abdomen scarcely more sparsely so; first suture straight, very fine, not impressed. Anterior coxæ not large, separated by one-fifth of their own width. Length 2.8–3.0 mm.; width 0.8 mm.

Florida.

Allied in antennal structure to *nimius*, but differing greatly in its small size and more slender form; the antennal club is relatively thicker than in *nimius* and the funicle gradually thicker toward apex. If the antennal funicle of these two species were not examined with great care, it would surely be pronounced 6-jointed, so thoroughly is the second joint hidden within the apex of the first.

**APPENDIX.****I.**

The following remarkable genus was received too late for insertion in its proper place among the tribes discussed in the present paper:—

**SCHIZONOTUS** n. gen. (Eirrhinini).

Body narrow, suboval, elongate and moderately convex above, the prothorax flexed downward. Head deflexed, deeply inserted, not visible from above. Eyes completely wanting. Beak nearly straight, bent slightly at apex and separated from the head by a distinct transverse impression. Antennæ inserted at apical third, the scrobes inferior, bounded along their upper margin by an acutely elevated carina; scape robust, gradually claviform, attaining the under surface of the head; funicle 7-jointed, joints two to five gradually decreasing in length, the second rather elongate but not quite as long or thick as the first, outer joints but slightly thicker; club well developed, abrupt, elongate, ovo-conoidal, gradually pointed, densely pubescent, the distinct sutures marked by dense recumbent laciniae. Prothorax oval, very oblique laterally at apex, transversely truncate at base, broadly, feebly constricted near the apex. Scutellum exceedingly minute. Elytra apparently connate, broadly, evenly emarginate at base, the latter not receiving the base of the prothorax. Prosternum rather long, sinuate at apex, broadly, deeply excavated along the middle, the sides of the sulcus acutely elevated. Meso- and metasterna extremely short. Abdomen very long, flat, the first two segments long, separated by a very fine arcuate suture; third segment short, the second and third sutures coarse and deeply impressed; fourth segment a little longer than the third, separated from the fifth by a very fine straight and almost obsolete suture; fifth segment much longer than the two preceding combined. Legs short but extremely robust, the femora stout, almost straight along the lower margin; tibiae very broadly triangular, strongly compressed, partially fimbriate at apex; tarsi attached at the inner angle of the tibiae, short, flattened, the subbasal joints transverse, the third but feebly dilated, fourth very short, scarcely one-half longer than wide, received for about one-half its length in the apical emargination of the third joint; claws rather long, slender, free, divergent and simple.

This genus is closely related to the European *Raymondionymus* Woll.—which appears to constitute a subgenus of *Alaocyba*,—so



closely indeed, that if Wollaston (Trans. Ent. Soc. Lond., 1873) did not repeatedly state that the antennal funicle in that genus is 6-jointed, I should be inclined to regard them as identical.

Besides the entire lack of eyes, thick fossorial legs, deeply excavated and bicarinate prosternum, excessively short sterna of the hind body and very elongate abdomen, with the fourth suture fine and almost obsolete, *Schizonotus* is remarkable in having the deflexed prothorax non-conformable with the elytra at base, the base of the former being truncate or even apparently somewhat sinuate, while that of the latter is deeply emarginate, the two bases being always widely separated and exposing a large part of the mesonotum.

It is not altogether surprising that Wollaston made the mistake of assigning these genera to the *Cossoninæ*; they certainly have a *cossonide* facies in some respects. The rostral, antennal, and prosternal characters, however, prove them to be aberrant members of the *bagoide* series.

***S. cæcus*** n. sp.—Rather dark red-brown throughout, polished, sparsely covered with short pale bristling setæ, which form single series on the elytral intervals. *Head* finely, the beak more coarsely, sparsely punctate throughout, the beak not quite as long as the prothorax, inflexed in direction, making an acute angle with the plane of the elytra. *Prothorax* rather longer than wide, the sides broadly arcuate, constricted at the sides just before the basal margin, the apex broadly arcuate and scarcely three-fifths as wide as the base; disk perfectly even, feebly convex above, finely but deeply, very sparsely punctate, without median line. *Elytra* elongate-oval, more than twice as long as wide and two and one-half times as long as the prothorax, in the middle nearly one-half wider than the latter; sides parallel and nearly straight in the middle, convergent and rounded toward base, convergent and straight or feebly sinuate in apical third, the apex narrowly rounded; basal margin acute laterally; disk with unimpressed series of rather small but deep, somewhat distant punctures, becoming coarse and deep on the inflexed flanks; punctures of the intervals toward the suture nearly as large as those of the series, the latter becoming almost obsolete toward apex. *Abdomen* very sparsely punctate but strongly so toward base. Length 2.0–2.1 mm.; width 0.7–0.75 mm.

California.

A most interesting species, apparently the only completely blind curculionide thus far recorded from North America; as might have been anticipated it has revealed itself in the subsiatic fauna characterizing our Pacific Coast.

The two specimens in my cabinet were kindly communicated by Mr. Chas. Fuchs, who discovered them while sifting mouldy earth among the red-woods north of San Francisco.

## II.

### **CYCLOSATTUS** n. gen. (Tenebrionidæ).

The species which I described under the name *Eusattus websteri* (Col. Not., III, p. 56) has the outline and general habitus of certain forms of *Eusattus*, but was placed in that genus without due examination of its generic characters; these I find to be very different, and, in order that the species may be understood, it is necessary to refer it to a new genus far removed from the Coniontini. It forms the second of the only two known North American generic types of the tribe Opatrumini (Col. Not., II, p. 391), the other one being *Ephalus* Lec. The principal characters may be given as follows:—

Body very broadly, evenly oval, rather strongly convex, the margins of the pronotum broadly, and of the elytra narrowly, reflexed. Head prominent at the sides before the eyes, transversely truncate at apex. Eyes transverse, emarginate at the middle. Anterior, intermediate and posterior coxæ equally and not very widely separated, the abdominal process narrow and obtusely angulate at apex. Legs not very long but slender, the anterior tibiæ with an externally produced apical process, the internal spur very minute; intermediate and posterior with two small slender terminal spurs. Tarsi slender, short, slightly compressed, coarsely pubescent beneath, the basal joint of the posterior not quite as long as the remaining three combined. Elytra widely embracing the body, the epipleuræ very wide, especially toward base. Third and fourth abdominal sutures fine, vertical and coriaceous.

On examination of the under surface the epipleuræ appear at first to attain the elytral apices, but this is not so in reality, the portion attaining the sutural angles being the narrow reflexed margin of the elytra, the plane of the under surface of which makes a strongly marked angle with that of the epipleuræ proper, throughout the entire extent.

Mr. F. Blanchard of Lowell, to whom I am indebted for calling my attention to the fact that *websteri* could not be retained in *Eusattus*, tells me that Dr. Levette found this specimen at Pueblo, Colorado, but whether collected there or otherwise obtained he is unable to state. I see no reasonable grounds for doubting its

North American origin, however, as it is no more out of harmony with the general tenebrionide fauna which surrounds it than the monotypic *Ephalus* of the Atlantic States.

### III.

#### LIPAROCEPHALUS Mäkl.

It is somewhat singular that the true affinities of this genus should have so long escaped observation, especially as its entire lack of harmony with all other types of *Pæderini* is so strikingly evident. *Liparocephalus* is a typical but highly specialized member of the tribe *Aleocharini*, belonging near *Phytosus*, and having the tarsal joints 4-4-5 in number.

### IV.

#### SYNONYMICAL NOTES.

In the Revision of the *Stenini* of America North of Mexico (Philadelphia 1884), I have created a considerable number of synonyms, these becoming evident from time to time as more extended series were compared with the somewhat meagre material which served as the basis of that memoir. A small part of the synonymy has already been given by M. Fauvel, and I now take pleasure in bringing forward as much as I have been able to observe from recent studies.

*S. rugifer* Cas. = *anastomozans* Cas. This is another interesting example showing the correspondence between the arctic fauna of the summit of Mt. Washington and that of the Rocky Mts.

*S. vexatus* Cas. = *insularis* Cas.

*S. placidus* Cas. = *tumicollis* Cas.

*S. villosus* Cas. = *jejunus* Cas.

*S. milleporus* Cas. = *sectilifer* Cas.

*S. difficilis* Cas. = *tenuis* Cas.

*S. nanus* St. = *nanulus* Cas. The eastern *pusio* Cas. is an allied but apparently distinct species, of narrower form and much larger head.

*S. humilis* Er. = *mammops* Cas.

*S. rigidus* Cas. = *ageus* Cas. The European *argus* is somewhat allied, but is much narrower, more parallel and less fusiform, with the abdominal segments decreasing less rapidly in width.

*S. brumalis* Cas. (♀) = *pauperculus* Cas. (♂)

*S. graciosus* Cas. = *hirsutus* Cas.

The species in the neighborhood of *morio* Grav. are very much confused, and, in my efforts to view a typical specimen from Europe, I have received four distinct species, in one or two cases differing radically in male sexual characters. The following synonymy is however sufficiently evident:—

*S. morio* Grav. = *indistinctus* and *haplus* Cas.

The type of *subgriseus* represents a species quite different from *morio*, in the abruptly very narrow sixth ventral segment and other characters.

*S. umbratilis* Cas. = *fraternus* Cas.

*S. pollens* Cas. = *patens* Cas.

*S. reconditus* Cas. = *propinquus* Cas. This species is stouter than the European *tarsalis*, and has the punctuation stronger and coarser; it also differs in male sexual characters. The differences become quite evident with the large series of both these species which I have before me. *Canadensis* is closely allied but has much shorter elytra.

*S. callosus* Er. = *varipes* Cas.

*S. punctatus* Er. = *dilutus* and *obsoletus* Cas.

*S. hubbardi* Cas. = *simiolus* Cas.

*S. lucidus* Cas. = *leviceps* and *politulus* Cas.







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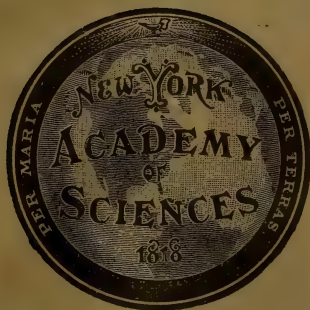
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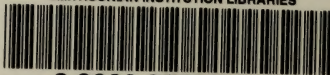








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